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ARCHIVES
OF
OPHTHALMOLOGY.

EDITED IN ENGLISH AND GERMAN

BY

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ARCHIVES OF OPHTHALMOLOGY.

REPORT AND COMMENTS ON THE EYEBALL-INJURIES BY IRON FOREIGN BODIES AT THE NEW YORK OPHTHALMIC AND AURAL INSTITUTE, NEW YORK CITY.

By DR. LOUIS STOLL, HOUSE SURGEON, AND DR. HERMAN KNAPP, EXECUTIVE SURGEON.

DR. HERMAN KNAPP, in March, 1899, communicated to the Section of Ophthalmology and Otology of the New York Academy of Medicine a paper entitled "Clinical Experiences with Haab's Powerful Electro-Magnet" (these ARCHIVES, xxviii., p. 167).

In that paper he reported fifteen cases, as published in American medical literature, and thirteen additional cases from his own practice, these latter having occurred subsequent to May, 1898, at which date Haab's large electro-magnet had been set up in the New York Ophthalmic and Aural Institute. Since the writing of that paper, fifty more cases have come under Dr. Knapp's observation, which Dr. Stoll has collected from the hospital record books. After that there are a smaller number, but instructive cases, which the present House Surgeon, Dr. Cooper, compiled according to the hospital record books. They will be presented, in accordance with the arrangement used by Dr. Knapp in his first paper, and each of the thirteen cases previously reported will be mentioned again in its proper group, for the sake of the completeness of the subject to the time of publication.

First group: Foreign bodies imbedded in the surface of the eye.

A—In the cornea.

CASE 34.—Louis Krug, æt. thirty-five, Hoboken, presented himself February 10, 1900. A piece of steel was fixed in the

corneal tissue. Removal by the foreign-body needle was not tried, fearing that it might push the fragment of steel into the anterior chamber. Easily extracted with Haab's magnet. Measures $2 \times 1 \times \frac{1}{2} \text{ mm}$. Admission into the hospital not necessary.

CASE 59.—Kathie Schenk, æt. nineteen, New York, came March 14, 1903. A few hours previously a piece of a sewing-needle struck her cornea; it was deep-seated, and failed to be removed by the foreign-body needle. Easily extracted with Haab's magnet. Wound was healed two days later.

B—In the sclerotic.

CASE 37.—Harry Burns, æt. twenty-five, Brooklyn. A chip of iron had struck his eye and remained fixed in the sclerotic. An unsuccessful attempt was made to extract it by forceps. Extracted by Haab's magnet, without loss or prolapse of vitreous. Patient had not to stay in the hospital. Wound healed; no impairment of sight mentioned.

These three cases were treated in the dispensary department, admission to the hospital not being required. Simple as they seem, we learn the advantage of the magnet in those cases where the removal of pieces of iron from the surface of the eye with the foreign-body needle was for some reason not advisable or physically impossible. In Cases 34 and 37, though it seemed feasible to remove the foreign bodies by other means than the magnet, there was danger of complications as a result of pushing the foreign body entirely through the cornea into the anterior chamber, or through the scleral tissue into the vitreous.

Second group: Foreign body in the anterior portion of the eye, in front of the lens or in it.

A—In the anterior chamber.

CASE 16.—**Piece of steel after piercing the cornea stopped in front of the iris; hypopyon; no lesion of the lens. Extracted through canal of entrance.** Recovery. V = $\frac{2}{80}$.

Meyer Caplan, æt. twenty-eight, Brooklyn, admitted April 27, 1899. Struck in left eye by piece of steel two days ago. Pericorneal congestion; pupil contracted (had eserine given by a physician); iris dull; hypopyon 1 mm . Severe pain. Perception of light only. A dark object is seen lying in anterior chamber

diagonally across the pupil and attached to the cornea at its one end, resting upon the iris with its other.

Operation.—The tip of a small magnet was placed in front of the eye and brought into contact with the cornea, where the foreign body seemed to be attached. By a few lateral motions it was dislodged. The current being directed straight in front of it, the chip was pulled out easily through the canal of entrance. It was a thin piece of steel, 4 by $\frac{1}{2}$ mm in dimension, with sharp ends. The next day hypopyon had disappeared; the pupil was fully dilated by atropine and clear. Wound healed. Patient discharged the third day. V = $\frac{2}{3}$.

Two of the cases reported by Dr. Knapp may be added as belonging to this group:

CASE 1.—Chip of steel in periphery of anterior chamber. Beginning iritis. Extraction by large magnet through entrance canal. Perfect recovery. V = $\frac{2}{3}$.

CASE 2.—Piece of steel in anterior chamber; attempts of extraction with small magnet unsuccessful. Hemorrhage. Foreign body disappeared, not indicated by large magnet. Eye blind.

Two of the three cases of this group are worthy of mention, because of complicating iritis, which in one case was present only forty-eight hours after the accident. In both the inflammation was controlled and good vision obtained. The infection had been limited to the anterior portion of the eye, and the lens showed no lesion.

In the third case the patient did not come until a week after the injury. The day following the accident, another physician attempted the extraction of the foreign body by a small magnet after making a new corneal incision. He failed, as blood into the anterior chamber hid the chip. On admission into the Institute, a hemorrhage in the vitreous and two wounds in the iris were found; tension was normal; field of vision defective. No evidence of the presence of a foreign body could be obtained. Patient discharged a few days later.

B—In the posterior chamber.

CASE 57.—Chip of steel, indistinctly located in posterior chamber, was entangled in iris tissue. Fresh corneal incision, through

which the foreign body was drawn out by Haab's magnet, being still entangled in iris. Iridectomy. Removal of the chip six weeks after the injury. Recovery. $V = \frac{18}{200}$. Beginning cataract.

Tom Hogan, æt. twenty-seven, Bowling Green, Ky., was admitted June 22, 1903, and said his right eye had been struck by a piece of iron six weeks ago. Wound healed quickly but eye remained irritable. Faint corneal scar, small hole in upper temporal portion of iris. Fundus clear after dilatation of the pupil; no foreign body visible. Circumscribed opacity of the lens. On approaching the tip of the giant-magnet toward the eye the iris was drawn toward the cornea near the scar, indicating the presence of the foreign body in the posterior chamber. Attempt failed to lead it through the pupil into the anterior chamber. The chip being entangled in the tissue of the iris, was prevented from getting around the pupillary margin. Fresh incision was made with keratome between the corneal scar and the limbus corneæ, and it was enlarged by Stevens scissors. At the same time iridotomy was performed parallel to the corneal section, enlarging the hole of the iris. After several attempts to get the foreign body through the incision made in the iris failed, the piece of steel covered by the iris was pulled through the corneal wound. The prolapsed portion of the iris was cut off and the iron found in the piece excised. Wound freed from prolapsed iris; pillars free; trace of blood in anterior chamber. The next day no reaction was evident; small hyphæma; wound smooth and clean. During the following week the eye became free from irritation; corneal wound healed nicely, no anterior synechia, but lens became gradually duller, and in the coloboma fine radii appeared extending toward the pupil. No changes in the fundus. $V = \frac{8}{200}$ when discharged.

CASE 6.—Piece of steel suspected in posterior chamber; iritis; hypopyon. Large magnet failed; eye recovered. Vision improved to $\frac{8}{30}$.

CASE 8.—Same patient as "Case 6"; came back two months after he left the hospital. Eye quiet. At first attempt by Haab's magnet iris bulged; corneal incision. Small Hirschberg, introduced into anterior chamber, failed to extract the foreign body. Large magnet extracted it. Recovery. Cataract removed. $V = \frac{20}{30}$.

CASE 13.—Chip of iron three months in eye; irido-cyclitis. Sediment at bottom of anterior chamber. In nasal part of iris

an indistinct black spot. After keratotomy iron extracted with Haab's magnet.

The forces which cause the foreign body to stop in front of the lens, as in the cases of this group, are not quite obvious. It is not certain whether the form of the chip, its direction, its rapidity, or the resistance offered by the iris tissue explains the fact that it did not penetrate the comparatively soft tissue of the lens capsule. In Case 57 the foreign body had lodged behind and maybe partially in the iris tissue, not exciting an iritis, and opacifying the lens only to a circumscribed extent. The fact that the foreign body had been fixed so tightly in the posterior layers of the iris seems to justify the idea that it had been attached there by a circumscribed inflammatory process, as is often the case with pieces of steel encapsulated in or upon the retina. The meshes of the iris favor the impaction of small even particles.

C—In the lens.

CASE 25.—Small chip of iron in anterior capsule resisted the powerful magnet and had to be removed with extraction of the opaque lens nine days after the accident. Remnants of lens absorbing. Recovery. $V = \frac{2}{200}$.

Honesto Pedro, æt. thirty-eight, Brooklyn, admitted June 23, 1900. Small black particle seen in anterior capsule of the lens. Slight abrasion of cornea. An unsuccessful attempt to extract the foreign body was made. Anterior chamber emptied when corneal wound had been reopened, but foreign body remained in its position. Lens opacifying quickly. Placed before magnet without result; suffered great deal of pain. July 2d, lens was removed partially by linear extraction, the foreign body coming out with the cortical substance. The next day wound was closed, anterior chamber filled, pupil round, some posterior synechiæ. During the following week lens-matter absorbed partially. July 15th, capsule contained some cortical unabsorbed. $V = \frac{2}{200}$ when discharged that day. Foreign body was a thin wedge-shaped piece of iron 0.5 by 1 mm in dimension.

CASE 60.—Small glistening substance in anterior capsule was attracted by Haab at first attempt. Extracted through new corneal section. Recovery. Cataract.

A. Friedmann, æt. thirty-five, New York, admitted October 28, 1903, two days after his right eye had been hurt. No congestion, small scar in lower-nasal portion of cornea, small circumscribed capsular opacity, small glistening foreign body upon the anterior capsule; no sooner was the eye approached toward the magnet than the piece of iron rushed against the posterior surface of the cornea and fell to the bottom of the anterior chamber. With Graefe knife a new section was made through the corneal scar. At the second attempt with the magnet the foreign body rushed out through the corneal incision. The next day wound was closed, anterior chamber filled, no reaction, patient discharged. A week later patient was seen in the Dispensary, his lens being opaque over the entire circumference of the pupil. Cataract extracted May 5, 1904. Vision with glasses = $\frac{2}{80}$ +; to be improved by discission.

CASE 63.—Chip of iron entered the eye through cornea and lens. Cataract. Extraction of a large piece of iron by Haab's magnet. *Panophthalmitis*; enucleation the fifth day after injury.

A. Jansen, æt. fifty-six, Hoboken, was struck by a piece of steel in his right eye a few hours previous to his admission on March 7, 1904. Wound in centre of cornea; point of the foreign body seen in cataractous lens. Pain when put near giant-magnet; iris bulged. The cornea and the whole globe moved toward magnet. At second attempt foreign body protruded through corneal wound and was extracted by magnet. It was a large, but thin black piece of steel with ragged edges, $6 \times 1 \times 3 \text{ mm}$ in dimension. No perception of light. During the following days, the lids œdematous, and chemosis, panophthalmitis. Enucleation the fifth day after the injury.

Cases 25 and 60 show nearly the same conditions as far as the size of the foreign body and its location are concerned, but they present an entirely different course. In the former case (25), the chip was not moved by the attracting power of the magnet. It apparently was entangled in the capsule, and not being voluminous enough it could not pierce the tissue blocking its way. It had to be removed with the opaque lens-tissue. In the latter case (60), the chip was attracted and dislodged from the lens; it fell to the bottom of the anterior chamber and was removed in the usual way. There is no reason whatever for the different behavior of the

two chips except that one was dark and perhaps had remained for some time in the eye, where it became oxydized and fixed. The other had been in the eye for but two days and was extracted before oxydation and fixation could take place.

In the third case, a large piece of iron had been successfully extracted by Haab's magnet only a few hours after the injury occurred. It had partially penetrated into the lens and its further progress had been blocked by it. Infection of the vitreous rendered enucleation unavoidable.

Third group: Foreign bodies in posterior portion of the eye, behind the lens.

A—Such as can be seen lying in the vitreous chamber by the ophthalmoscope.

CASE 20.—Piece of steel surrounded by exudate was seen in vitreo two days after the injury. Removal through canal of entrance failed. Extracted through new opening. Prolapse of iris cut off. Slow recovery. Cataract.

Mich. F. Foomey, æt. thirty-four, Rochester, N. Y. Two days ago piece of steel flew into left eye while hammering; slight pain since. Sight impaired since yesterday. Admitted July 26, 1899. Point of entrance plainly visible at nasal side of cornea near limbus; opening in iris; track through lens. With ophthalmoscope piece of steel can be seen lying in lower and inner portion of fundus surrounded by a small quantity of exudate. Vitreous fairly clear. Vision = $\frac{10}{200}$. Field normal.

Operation.—At first no evidence of the presence of a foreign body in the eye, when the magnet was brought into contact with the cornea. Tip of magnet then applied near sclerotic at point where foreign body was known to lie. After moving magnet to and fro for a moment in this region, it was again applied to cornea at the point of entrance. Immediately iris bulged and foreign body engaged in the iris tissue. Corneal section made vertically through scar, and with small magnet a flat piece of steel 3 x 1.5mm in dimension was withdrawn. It brought with it the iris, which, being somewhat lacerated, was abscised, leaving a clear coloboma; atropine; bandaged. The next day no decided reaction, but after some days some pericorneal congestion, pupil half dilated; in coloboma a tongue-like projection on anterior capsule, whitish in color, probably exudation from ciliary body;

wound ragged, slightly infiltrated. Cataract developing. During the following months wound became clearer; the tongue-like projection gradually absorbed. Lens swollen; iris bulging; one temporal synechia. — T. No pain. After several relapses during September the eye has gradually and slowly become free from irritation. Tn. Lens becoming more and more opaque. V = perception of light. Discharged September 25, 1899.

CASE 22.—Piece of steel entered at sclero-corneal junction; was seen seven days afterwards in retina imbedded in exudation. Indicated by Haab's magnet. Extraction through new corneal incision along limbus; hemorrhage into vitreous. Recovery.

Purdie, Ireland, æt. forty-five, New Haven, Ct.

While chipping a screw on October 7, 1899, a piece of steel entered left eye at the inner corneo-scleral junction and became lodged in the retina. On admission a week later, on October 14th, he had no pain, hardly any reaction; vitreous clear; retina congested; veins filled. Foreign body seen in retina and sclera near the disk, imbedded in a white fibrinous exudation.

Operation.—Pain was felt when cornea was brought into close contact with Haab's magnet. At the second trial iris was seen bulging. Section with Graefe knife along limbus on lower and nasal side of cornea. At the fourth attempt foreign body was brought to the surface, and bringing the eye very close to the magnet the chip was extracted, 8 x 2 x 1 mm in dimension. The next day no blood in anterior chamber, fundus illuminable, but no details could be made out; field no more contracted than before the operation; can count fingers.

During the following week, improvement, less congestion, lens clear, details of the background recognizable, wound firmly closed but small portion of the iris adherent to it. Details at periphery of fundus indistinct, but no detachment of retina. October 29th, sight was poor; — T. Lower and inner portion of retina dull, no detachment as yet; disk seen clear. When discharged November 4th, details of fundus not yet discernible; defect of field more extensive and only upper portion of fundus illuminable. Tn. Vision = movement of the hand.

CASE 24.—Chip of steel seen with ophthalmoscope in retina surrounded by a small hemorrhage. Foreign body loosened but not attracted by magnet; fresh hemorrhage followed. No irritation. V = $\frac{2}{3}$.

Harvey Garrison, æt. twenty, Wilkesbarre, Pa. Admitted

December 9, 1899. The same day a piece of steel had entered right eye at the outer-upper portion of sclera. The foreign body was seen glistening between macula lutea and optic disk; small hemorrhage below and temporal from it. Several times the tip of the magnet was placed to the cornea and no reaction or pain was felt; decided pain when placed on caruncle; after that trial a fresh hemorrhage was seen near the foreign body, the latter not having changed its position. At the place where it had been the day before, there were noticed by the ophthalmoscope a blood-clot and, extending from its lower border, a streak of coagulated blood crossing to the temporal side of the disk. The hemorrhage is subretinal, the retinal vessels being recognized as crossing over it. Temporal portion of the fundus hazy; in lower part of vitreous streaks of blood. Scotoma about forty-five degrees above the median line, twice the size of the blind spot. Four days later fundus was clearer, but foreign body was not seen again. $V = \frac{2}{20}$. The eye being quiet, no further trials made with magnet. Discharged December 14th.

CASE 35.—Long piece of iron entered eye through sclera six hours ago. Section at limbus; iridectomy; foreign body extracted with Haab's magnet. Hemorrhage into vitreous, and detachment of the retina. Counts fingers.

David Foster, æt. twenty-two, New London, Ct.

Eye struck with chip of iron six hours previous to admission on October 12, 1901. Ophthalmoscope revealed a patch of hemorrhage below the disk. $V = \frac{20}{200}$. Field contracted at upper and inner part. Sideroscope indicated presence of iron. At first trial with Haab's magnet foreign body presented itself at lower portion of iris. A small opening made at limbus with bent keratome and enlarged by Stevens scissors, then piece of iron drawn out by magnet, a small piece of iris prolapsing, which was cut off. Anterior chamber and vitreous full of blood, so that the patient could not see anything. Original wound in sclera below and to outside of cornea. Foreign body is a large, somewhat curved, three-sided chip of iron, 9mm in length, 1 to 2mm thick. Eye improved during the following days; could count fingers; field defective at inner and upper part of periphery. November 8th, a large hemorrhage near optic disk and a central detachment of the retina were noticed. Patient left November 27th, his eye being in good condition; he was able to see well except directly in front; central detachment of retina still present.

CASE 36.—Piece of steel seen sticking in retina. Another physician enlarged the original scleral wound and tried magnet in vain. Haab's magnet unsuccessful during three days. Infection of wound and globe. Enucleation.

George G. Hopkins, æt. twenty-five, Brooklyn; January 6, 1902, while hammering, the left eye was pierced by a piece of steel through sclerotic, about half way between limbus corneæ and canthus internus. No blood escaped. Patient felt no pain, but saw two big black spots before his eye, and every object looked at appeared hazy. Physician in Brooklyn noticed the presence of a piece of steel in the vitreous. He enlarged the original scleral wound, introduced the tip of a small magnet, but failed to attract the foreign body. Patient came to the "Institute" the next day. Small wound was found as described above, pupil fully dilated, blood at the bottom of vitreous chamber, extensive detachment of retina. At upper and inner part of retina was seen a bright-shining piece of metal with very irregular borders sticking in the tissue. At the nasal side of the foreign body was a rent in the retina about 1.5 P.D. in length, 0.5 P.D. in width, and filled with blood. Sideroscope furnishes no evidence of the presence of steel in the eye. Haab's magnet failed to dislodge it even after several attempts. Eye bandaged; patient put to bed. The next day upper lid slightly swollen; conjunctival congestion; scleral wound infected. Tn. Perception of light, except at extreme temporal border of field. Faint red fundus-reflex. Foreign body seen in front of detached retina. The use of Haab's magnet did not cause any pain, but as it did not move the foreign body patient was placed in bed again. January 9th, trial with magnet repeated, without result. Increased quantity of pus from wound. The following day pupil narrow, did not dilate under atropine; eye soft, iris discolored. Enucleation. Discharged January 16th.

CASE 38.—Chip of steel entered through sclera; seen by ophthalmoscope; brought into anterior chamber by Haab's magnet; extracted through new corneal section. Recovery; perception of light.

R. J. Ryan, æt. thirty, New York. Was admitted January 15, 1902, piece of steel having entered through sclera. Foreign body seen indistinctly in upper and nasal side of vitreous chamber. Can see movement of the hand in upper portion of the field, which is contracted. Foreign body brought into anterior

chamber, where it fell to the bottom. Removed by large magnet through a fresh incision of cornea. During the following days corneal wound healed, eye became free from irritation; pupil was round, dilated under atropine. Sclera wound closed slowly; no loss of vitreous. Tn. No reflex from fundus. $S = \frac{1}{\infty}$ when discharged on January 26th.

CASE 41.—Piece of steel entered through cornea and iris; was seen in vitreo through ophthalmoscope. Extracted nine days later through fresh corneal section; recovery; $V = \frac{2}{3}$.

J. E. Anton, æt. forty-three, Cincinnati, Ohio. While striking a chisel, on April 29, 1902, a small piece of iron entered left eye. Admitted May 8, 1902. Corneal wound in centre of the lower and temporal quadrant, 2mm from limbus; wound in iris patulous, $\frac{1}{2}$ mm in width and 2mm in length. Has suffered but little pain, of intermittent character. Eye moderately congested, pupil well dilated and round, fundus reflex good, opacities of vitreous to the lower and temporal side. Details of fundus and the foreign body can be seen, the latter suspended in vitreo, not far from retina. $V = \frac{2}{3}$.

Operation, April 29th.—The foreign body was drawn through the pupil with Haab's magnet. It lodged in the corneo-iridic angle; section with keratome downward and upward. Foreign body extracted. Piece of steel $2\frac{3}{4}$ mm long and 1mm wide. The next day an anterior synechia was seen, which disappeared during the following days, when tension was normal. Pupil well dilated, so that a small opacity of the peripheric area of the lens was noticed. Recovery. On discharge, May 25, 1902, field normal. Tn. Opacity of the lens did not increase. $V = \frac{2}{3}$.

CASE 43.—Chip of steel, after entering eye twelve days previous to admission, was seen with ophthalmoscope. During nine days unsuccessful attempts with magnet. Foreign body not found. Iritis; recovery; sight improving,

William Reich, æt. forty-four, New York. Twelve days ago, while striking a rusty hook, left eye was hit by something. Eye red and painful ever since. On admission, June 11, 1902, eye considerably congested; pupil moderately dilated. Tn. $V = \frac{1}{2}$. Not mentioned where foreign body entered, but it seems as if it found its way through cornea and iris, as iritis followed. Ophthalmoscope showed opacities in vitreous and foreign body lying just below the disk. Large magnet was tried unsuccessfully every day during the following week, while symptoms of iritis

became more pronounced and sight diminished to $V = \frac{4}{200}$. June 20th, the last attempt made with magnet in presence of Professor Haab, who happened to be in New York, but without result; slow recovery. $V = \frac{12}{200}$ when patient left July 7, 1902.

CASE 58.—Chip of steel entered ten days ago, seen in vitreous; iritis; unsuccessful trials with magnet during two weeks. Recovery. $V = \frac{15}{200}$.

F. L. Salisbury, æt. twenty-four, Bowling Green, Ky. L eye struck by a piece of steel ten days ago. Admitted August 20, 1903. Small scar, a trifle temporally to centre of cornea; anterior chamber hazy, slight iritis; circumscribed central opacity of the lens made fundus appear indistinct. $V = \frac{5}{200}$. Sideroscope showed no motion. Magnet caused pain when approached to lower nasal portion of the cornea. No result from the magnet the next day. Had atropine every two hours, pupil became fully dilated, and anterior chamber clearer. August 22d, trial with magnet repeated. When patient is looking as far down as possible, in the lower periphery of the fundus a white reflection appears, resembling a choroidal atrophy, in size larger than the disk, and in its location slightly nasal to median line. In a certain position metallic reflex from the spot described. During the following week the magnet was tried repeatedly and always in vain. It caused severe pain, though no bulging of either sclera or iris was noticed. Fundus cleared up; in the lower portion of the white area there was a perceptibly darker, somewhat grayish reflex, supposed to be the piece of steel. August 30th, same condition; last attempt made by magnet, painful and resultless. When patient left, on September 16th, the eye was free from congestion, pupil fully dilated. Cataract increasing downward and nasally in the posterior portion of the lens. Details of fundus no longer visible. $S = \frac{15}{200}$.

Though in the nine cases of this group the foreign body was seen in the vitreous, the magnet failed to extract it in four of them. In one case the eye was taken out for panophthalmitis, resulting from the infected foreign body (Case 36). The presence of the chip of metal was shown by the ophthalmoscope, while the sideroscope failed to indicate it and the magnet to extract it.

The three other cases, where the magnet was applied unsuccessfully, show better features. One (24) came the

same day ; the media being clear, the foreign body could be seen in the retina, surrounded by a hemorrhage. Under control of the ophthalmoscope the magnet was applied, the chip became loose, and a fresh hemorrhage occurred. The foreign body changed its location, could not be seen four days later, and did not produce any irritation. The eye became quiet. $V = \frac{20}{20}$.

Cases 43 and 58 are similar, in so far as during one or two weeks the magnet, when applied at certain spots of the surface of the eye, caused considerable pain, but did not bring the chip to a position whence it could have been extracted. Both eyes developed iritis, which was cured, and in neither was the attempt made to remove the steel through a fresh scleral incision, as the irritation diminished. Sight was moderate ($\frac{12}{200}$ and $\frac{15}{200}$), but in either case improvement was to be expected after removal of the cataract in one, and after the absorption of opacities in the vitreous of the other.

Of the remaining five cases, one (41) acquired good sight ($\frac{20}{20}$), while in four the shape of the eye could be preserved, and later improvement of the sight could be expected, when the existing cataract or hemorrhage in the vitreous had received the proper treatment.

Case 22 may be specially mentioned, because of the successful result, in spite of the fact that the foreign body had been imbedded in an exudation of the retina when patient was admitted, and the operation was made a full week after the injury. It seems as if the success of the magnet in the cases of this group depended somewhat on the size of the chip ; the larger chips could be removed, the smaller ones were lost in the vitreous.

Cases 20, 22, 35, 41, show pieces of 3×1.5 , 8×2 , 9×2 , $2.75 \times 1 \text{ mm}$; the size of the particle removed from Case 38 is not mentioned, but was certainly not very small, as the hard sclera had been penetrated. The pieces seen in the vitreous of the unsuccessful cases, 24, 43, 58, were apparently smaller. In Case 36, the size of the foreign body is doubtful. The sclera had been penetrated, and the history stated that a "particle of metal with very irregular borders

and sticking in the tissue" had been shown by the ophthalmoscope. Unfortunately no pathological history is at hand ; it seems, however, as if in this case a larger piece of steel entered the eye, became fixed in its posterior wall, and consequently resisted the attractive power of the magnet.

(To be continued.)

SOME INJURIES TO THE EYE FOLLOWING SUBCONJUNCTIVAL INJECTION OF SALT SOLUTION.

BY DR. L. ALEXANDER, NUREMBERG.

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SUBCONJUNCTIVAL injections of bichloride, which were introduced into eye-practice by Reymond, Secondi, and Darier, were, as is well known, soon employed in the most diverse forms of eye-disease, and described in many reports as unusually efficacious. However, as is usually the case with new methods and new therapeutic agents, in a short while the enthusiasm died out, and finally it was discovered that not only were there many cases in which no results were attained, but a large proportion in which decided injurious effects were observed. It is unnecessary for me to go over the extensive literature on this subject here; suffice it to mention that, among German authors, it was especially Mellinger (1) and his pupils who studied this question, and who called attention to the dangers and injuries to the eye attendant upon subconjunctival injections of bichloride. It is chiefly owing to their labors that the operation of subconjunctival injections of bichloride (at least in Germany) has been largely abandoned.

The three important points scored against the above-mentioned method, by the Basel school, were as follows:

1. It was shown that subconjunctival injections of bichloride were often badly borne. Eyes which were thus treated often remained in an irritable condition after complete cure of the condition for which treatment was instituted.

"There is no longer a characteristic congestion of the eye. However, there are photophobia and excessive lachrymation. The bulbar conjunctiva, especially at the points of injection, is noticeably thickened, a pale dirty red, and of jelly-like consistence. Sensation is diminished at these points. Marti, in his Basel dissertation, mentions a case in which, after two subconjunctival injections, consisting each of one minim of a bichloride solution (1:2000) with $\frac{1}{10}$ % NaCl, a necrotic patch, containing no vessels, 4mm long and 2mm broad, appeared. After six weeks it disappeared, leaving a dull white area."

Furthermore, there were noticed adhesions between the bulbar conjunctiva and the sclera at the points of injection, so that it was impossible to make a cocaine injection in these areas. "In the enucleation of two eyes, it was impossible to dissect off the conjunctiva in these places. A microscopic examination showed these portions of the conjunctiva to have a peculiar, homogeneous yellowish appearance, with larger and smaller hemorrhages. The deeper parts, which showed considerable infiltration, were firmly united to the underlying sclera. The blood-vessels were very much dilated, and embedded in firm connective tissue" (Mellinger).

2. There has been no positive proof that in subconjunctival injections the bichloride reaches the interior of the eye, to act there as a disinfecting agent. Many experiments, described by me in another paper (2), militate against this view.

3. Numerous observations on the eyes of the lower animals and of the human being showed that bichloride acts upon the energy of the lymph-currents only in its capacity as a salt "by exciting currents of diffusion, which are, however, very slight, since the larger part of the bichloride is changed into an insoluble albuminate of mercury in the tissues" [Pichler (3)]. If bichloride is effective only in this way, we have a much more valuable agent in common salt, which, as Heidenhein showed, is an excellent lymphagogue.

These facts caused Mellinger to substitute for the bichloride injections subconjunctival injections of NaCl. This procedure was first recommended by Rothmund (4) in 1866,

but had since fallen into oblivion. In a large number of papers, the Basel clinic has since demonstrated that the subconjunctival injection of common salt is an extremely efficacious therapeutic agent (Mellinger, Marti, Schiess-Gemuseus, Wehrle, Zehender, Burri). Two per cent. solutions were used in diseases of the cornea, and 4 % and 10 % solutions in diseases of the interior, as choroiditis, diseases of the vitreous, and detachment of the retina. The entire contents of a Pravaz syringe were used. When smaller quantities were used, the results were less marked (Mellinger). According to Burri (5) and Mellinger, the method has no disadvantages. "There is no pain when a few drops of a 2 % cocaine solution are used in the conjunctiva, and the slight irritation of the conjunctiva always disappears in a short time. After 40 to 60 injections, the bulbar conjunctiva becomes inflamed and painful, but this rapidly disappears when the injections are stopped. Adhesions never form between conjunctiva and sclera. Even after extensive use, gangrenous patches have never appeared, as was sometimes observed after the use of bichloride." As a rule, the injections can be repeated daily, and only in rare cases do slight conjunctival irritation and ecchymoses necessitate their stoppage for a time.

The observations of the Basel clinic have since then been confirmed by a large number of writers. Even in those cases where more concentrated solutions were used [Dor (6) and Bourgeois (7) used 20-33 per cent. solutions successfully], the eye showed no ill-effects. That there are exceptions to this rule, however, even when solutions of ordinary strength are used, is evidenced by three cases which I have seen, and which I therefore consider worthy of a detailed description. The third case was seen by my colleague, Dr. Neuburger, for whose kindness in sending me this case, and allowing me to use it here, I tender my sincerest thanks.

CASE 1.—The eighteen-year-old servant girl, N., came to my office in November, 1902, on account of poor vision. There are diffuse opacities in the deeper layers of both corneæ. No inflammatory symptoms. A long time ago she was treated in the Erlangen University clinic, where she received many injections

of NaCl. I placed a small quantity of dionin powder on the conjunctiva. Instead of the intense chemosis which normally follows this procedure, the bulbar conjunctiva became only slightly œdematous, and numerous white linear scars appeared upon the reddened background, showing where the conjunctiva was adherent to the sclera.

From Professor Oeller I received the following information: "I treated the patient N. about one half year for a severe interstitial keratitis of both eyes. She received subconjunctival injections of NaCl on both sides. The strength of the solutions is not noted, but I think she received the strength ordinarily used in the clinic, $2\frac{1}{2}$ –5 %." Professor Oeller adds that he has used NaCl injections in a large number of cases, but seldom stronger than 5 %. However, even with 10 % and 20 % solutions he has never had a serious complication.

To recapitulate, this case showed, after a large number of injections of $2\frac{1}{2}$ –5 % NaCl solutions, the same adhesions between conjunctiva and sclera which occur when bichloride is used. This was demonstrated by the use of dionin in the conjunctival sac.

The injuries were more serious in the two following cases.

CASE 2.—The merchant L., age twenty-nine, was sent to me by his family physician in the middle of April, 1904. The patient, a very nervous man, complained for some time of foggy vision in the right eye, which is also inflamed. With the left eye he has seen poorly for a number of years. The eye has squinted since that time. The disturbances in the right eye are similar to those which he noticed when the trouble began in the left eye. Present condition: The left eye shows no inflammatory signs. It is turned outward and upward. Fingers, at six feet, are recognized only in the peripheral part of the field. There are numerous atrophic patches in the choroid, some bordered by pigment. A patch, the size of the disk, is seen at the macula. This causes a large central scotoma. The right eye shows slight pericorneal injection. Under the lower part of the limbus there is a circumscribed portion which is more strongly injected. The dark tone indicates intraocular disease. There are fine diffuse opacities in

the vitreous, also a few shreds. In the periphery, low down, there are five recent choroidal patches, the largest of which is the size of the head of a pin.

Vision = $\frac{6}{12}$; with + 0.5 cyl. axis vert., $\frac{6}{8}$. Reads Niden type 0.4 at 30cm.

There is nothing to indicate syphilis or tuberculosis. The patient says that he was myopic as a child, and received the following distance glasses from an oculist fifteen years ago:

R — 6 D sph. \bigcirc — 3 D cyl. axis horiz.

L — 2.5 D sph. \bigcirc — 2.5 cyl. axis horiz.

Four years ago he received at the University clinic — D sph. for both eyes. At the last examination, August 27th, he sees $\frac{6}{8}$ with + 0.5 cyl. axis vert. (The ophthalmoscope shows the vertical meridian to be emmetropic, the horizontal to have 1-2 D of hyperopia.) The disappearance of so high a degree of myopia is remarkable.

I ordered at first aspirin and diaphoresis, and later KI and inunctions with ung. ciner., and locally, atropine, warm compresses, and smoked glasses. The patient complained of nervous disturbances, so that the inunctions and KI had to be stopped. On May 8th, under cocaine anæsthesia, I injected the contents of a Pravaz syringe of a 5 % NaCl solution, which was well borne. The irritation disappeared on the next day. As there was some subjective improvement, I repeated the injection the following week, using this time a 10 % solution, which was of course carefully sterilized. About five hours later, I was called to the patient's house, where I found him considerably excited and complaining of severe pain in the eye and head. I removed the moist compress, and found nothing outside of the artificial injection and swelling. I ordered cold compresses and antipyrin.

On the following day, the patient complained of severe pain in the eye. The signs of irritation, which I ascribed the evening before to the injection, had not disappeared. The bulbar conjunctiva was, on the contrary, more inflamed. There were photophobia and lachrymation. In the course of that and the next day, the symptoms became more severe.

On May 19th (four days after the injection), the lower part of the bulbar conjunctiva was chemotic; there was a large dirty-blue area, which indicated a coming gangrene. To relieve the pressure symptoms, I made numerous small incisions into the conjunctiva with the scissors, and noticed that the conjunctiva was

infiltrated and like a mass of jelly. The discoloration increased, and on the 21st a portion of the conjunctiva, 5 x 13mm, was necrotic. The upper border of the gangrenous patch reached to the lower part of the limbus corneæ. On the next day the patient complained that his sight was getting worse. It was seen that the lower third of the cornea, which was adjacent to the necrotic conjunctiva, was stippled in appearance. The mirror reflex was uneven, but there was no loss of substance. Fluorescein showed, in this region, numerous small green dots, which seemed to be subepithelial. I applied a wet compress. Next day the pain abated somewhat, but vision was worse. $V = \frac{6}{60} - \frac{6}{36}$. The cornea looked somewhat better. Under complete mydriasis, I saw, by oblique illumination, that peculiar irregular reflex on the lens which is the forerunner of cataract. On examining with a strong lens (+ 11 D), I discovered two linear opacities in the anterior part of the lens (perhaps folds of the capsule). The lower line was horizontal, and the upper slightly oblique. The vitreous was clearer; it seemed, therefore, to have reacted well to the salt injection. Contrary to my expectation, the condition improved considerably in the next few days. The subjective symptoms improved; on the 26th, the cornea was normal, and on the 28th the changes in the lens had disappeared. Vision was $\frac{6}{6}$ with + 0.50 cyl. axis vert. The necrotic portion of the bulbar conjunctiva had meanwhile separated, and the defect healed with scar-formation. The present condition (August, 1903) is as follows: Bulbar conjunctiva is slightly reddened and shows a few linear cicatrices. Cornea and lens normal. The vitreous contains a few fine opacities. In the peripheral part of the choroid, low down, there are several atrophic patches. No new patches. Vision, with + 0.5 cyl. axis vert., is $\frac{6}{6}$. No more subconjunctival injections were made in this patient.

In this case, the subconjunctival injection of 1gm of a 10 % NaCl solution did considerable damage. It led to extensive necrosis of the bulbar conjunctiva, and gave rise to peculiar changes in the cornea and lens, which luckily passed away in a short time. The latter changes were also seen in the following case, which my colleague, Dr. Neuburger, observed here, and had the kindness to place at my disposal.

CASE 3.—Woman, fifty-three years old. Subconjunctival injec-

tions of a 5 % NaCl solution, with the addition of acoin, were made, for a myopic detachment of the retina. The first ones were well borne. After the fourth, sixth, eighth, and ninth injections, opacities of a peculiar kind were seen, like the microscopical contours of steam, with a network of fibres in places. This was best seen with a strong lens (+ 10 D). The cornea also showed opacities. With oblique illumination, the anterior surface of the cornea had a stippled appearance. These observations were made on the third to fourth day after each injection. About eight days after the injection, the changes disappeared. When the compress was taken off earlier, the changes in the cornea also disappeared sooner.

In this case, therefore, the operation had similar results to those observed in my case. It is especially noteworthy that in Neuburger's case the picture was repeated several times. He used only 5 % NaCl solutions, with the addition of acoin. (The latter substance could not be held responsible for the trouble, as I had not used acoin. I had added two drops of a 3 % cocaine solution to the NaCl.)

The changes in the cornea were similar to those seen in my patient,—the same changed reflections of the cornea, which appeared stippled, without a defect in the epithelium. Since the cornea returned to the normal more rapidly when the compress was removed earlier, one might suspect that the changes were caused by the compress. This, however, is not possible, since my patient did not receive his compress until the corneal changes had already appeared, and I feared that it might lead to an ulcerative keratitis. It is my opinion that, in Neuburger's as in my own case, there were disturbances of nutrition in the corneal epithelium, which, luckily, were not so extensive as to cause a lasting injury to the superficial layers of the cornea. Perhaps the condition was due to a hyaline exudation, which was reabsorbed in a few days. At first I considered the corneal condition to be the result of the extensive destruction of the conjunctiva, but this view was shown to be incorrect, since in Case 3, with a normal conjunctiva, the corneal changes appeared repeatedly. We must, therefore, look on these changes as the direct result of the NaCl injections. The affection of

the lens, which I first discovered on the seventh day after the injection, is of especial interest. I was unable to make a careful ophthalmoscopic examination until that day, on account of the extreme irritability of the eye. As the changes were already very extensive when I first saw them, it is very likely that the process had started several days before. Neuburger saw the changes in his case, three to four days after the injection. On examining with a strong lens, I gained the impression as if there were folds in the lens capsule. From day to day, I could follow the improvement of the condition, this improvement being accompanied by a corresponding improvement in the vision. On the thirteenth day after the injection, the lens appeared normal. Since the changes here were only temporary, we can assume that here also, as in the case of the corneal changes, we had to deal with exudations which were afterwards absorbed.

In the patient L. (Case 2), the bulbar conjunctiva was the first to become affected, whereas in Neuburger's case it remained intact. On the fourth day after the injection, I noticed the beginning necrosis, which, in its further course, led to a large loss of substance. This healed later by cicatrization.

To sum up, we saw that 5-10 % subconjunctival injections of salt solution were followed by various injuries to the eye. Not only adhesions between bulbar conjunctiva and sclera, and partial gangrene of the conjunctiva (complications which were seen to follow bichloride injections), but also transient changes in the cornea and lens.

I have seen no similar reports in the literature. As I have quoted from the opinions of Burri and Mellinger, it is emphatically stated that no injuries follow this procedure. Pichler, in his critical collective report on medicinal therapy in ophthalmology, recommends the use of subconjunctival injections of salt solution, with the words: "It is a healing agent, and no poison, which we give here." This opinion is endorsed by every ophthalmologist. Yet our cases show that this healing agent may show some very unpleasant side-effects, even when the solutions do not exceed 10 % in strength. Perhaps we will soon hear more on this

question from other sources. It will perhaps be decided in the future, whether salt solutions cannot be entirely replaced by aqua destillata. Pagenstecher (8) saw the same results follow the use of aqua destillata, especially in cases of purulent corneal ulcer, as with injections of NaCl solutions.

Ohlemann (9) has recently called attention to a very simple substitute. It is well known that dionin, which has been playing an important rôle in ophthalmology in the last few years, when placed in the conjunctival sac, possesses the interesting property of causing an intense chemosis, as an expression of lymph-stasis. "We shall soon see whether it is more efficient than subconjunctival injections or not. At any rate, this agent has the advantage of being much easier of application; although both methods produce the same results, namely, a chemosis, one through lymph-stasis and the other through injection of a fluid, we should conclude *a priori* that the more natural lymph-stasis would bring about the more rational method of absorption." In my opinion, the dionin method cannot have the same value as injections, since the eye soon becomes accustomed to the dionin, and the desired reaction, namely, chemosis, can only be obtained after a long interval of rest, whereas the injections can be repeated every two or three days, if the signs of irritation disappear rapidly. Perhaps some new preparation will soon be placed at our disposal, which will serve better in this regard than dionin.

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ARE THE ANOMALOUS TRICHROMATES FIT FOR SERVICE ON RAILROADS?

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Translated from the German Edition, May, 1904, by Dr. MATTHIAS
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THE studies of the deficiencies of the color-sense have revealed in addition to the two known types of dichromates, the deuteranopes and protanopes,¹ the existence of two similar anomalous trichromatic systems. Lord Rayleigh examined 23 persons, and found 5 of the first type and 2 of the second among them. Donders selected 60 persons who were not color-blind and found 4 anomalies of the first type. In the same way A. Koenig found 3 out of 70 selected cases, and von Kries 1 out of 20, all of the first type, while Levy has recently confirmed and studied the second type described by Rayleigh, which had remained neglected and forgotten since his time. Thus we see that, aside from Rayleigh's observations, in which the subjects were not selected, 8 out of 150 trichromates, $5\frac{1}{3}\%$, belonged to the first type. It may be assumed that the second, apparently rarer, type will be observed more frequently in the future now that attention has been called to its characteristic by Levy.

The question for our consideration is, to what extent these

¹ A person who possesses the three fundamental color-perceptions according to the Helmholtz theory—red, green, and violet—is said to be trichromatic; if perception of one color is wanting (partial color-blindness), he is said to be dichromatic. According to v. Kries's nomenclature, one who is red-blind is called a protanope, one who is green-blind a deuteranope, and one who is violet-blind a tritanope.—W. A. H.

anomalies are injurious in business life, particularly whether they render their subjects unfit for service on railroads or on the sea. I have followed the method of Donders to determine the exactness of the color-sense by means of the smallest visual angle in which the specific characteristics of a color can be recognized. This method complies with the simplest form of the demands of the service, that a colored signal of a given size must be recognized at a certain distance. It also furnishes the opportunity to determine mathematically the power of recognition for any single color, and so permits the comparison of the results obtained in the examination of normal and abnormal trichromates.

Much uncertainty is attached to this method. It requires a great deal of practice to specifically recognize a color with a very small visual angle, and therefore the result obtained is a measure not simply of the color-sense, but also of the talent for observation, which improves during the investigation even in persons accustomed to make minute observations. In addition, the eye becomes wearied quickly and contrast colors appear on prolonged fixation. Furthermore, the conditions are not equally favorable for the recognition of different colors. Some appear luminous at a greater distance than that at which they appear colored, and the eye is already fixed on the point to be observed when the specific color is perceived ; others appear colored at the moment when they are seen. Some also are easily perceptible by peripheral vision, while others can be recognized only with the central. The latter is peculiarly the case with red, which is not recognized until, as the visual angle is increasing, the red light happens to fall on the macula, but then while it is held firmly fixed by the eye the light may be carried three or four times as far away without loss of the specific impression. Still further, even when the colors have been selected so as to have their clearness as nearly equal as possible, there remain peculiarities which suffice to permit the recognition of the individual color tests. For these reasons this demonstration was conducted so as to rely on the judgment of the observer to determine when he believed he saw the specific color. For example, when it had approached

beyond the specific limit, he had the color carried back until he believed he had found the limit. Reliance was therefore placed on the conscientiousness of the observation in a manner that could not be followed in most observations, least of all in investigations regarding fitness for service. But with a few very skilful associates I was enabled thus to obtain reliable figures valuable for comparison. A thorough study was made of only two normal and two abnormal trichromates, one of the latter of which belonged to the first, the other to the second type. All four were skilled observers, and their skill had been increased by previous attempts until a sufficient certainty had been attained to make the results of value.

A ten-candle power ground-glass incandescent light was placed in a wooden box from which all other light was excluded. In the front of the box was an aperture holding a disk of milky-white glass to render the transmitted light very diffuse. In front of this was a black metal plate with two movable circular disks, one in front and one behind. The anterior one had five apertures measuring 20, 10, 5, 2.5, and 1.25mm in diameter; the posterior one five apertures each 20mm in diameter, in which were inserted five glasses, white, red, green, blue, and yellow, as nearly equal in clearness as possible. The examination was conducted in a dark room ten metres long. As has been stated, the finer determination of the liminal value is obtained through variations of distance. As this could be combined with variations in the size of the aperture, a very extensive total variation could be obtained, together with the power to control the accuracy of the statements. At first all, or a number, of the apertures were used, and the fact was demonstrated that a doubled distance of the limit of perception corresponds to the doubled diameter of the aperture. In the results therefore the quotient $\frac{D}{a} \left(\frac{\text{Distance}}{\text{aperture}} \right)$ alone is given, and this is a definite measure of the visual angle, or of the stimulated surface of the retina. $\frac{D}{a} = \frac{1m}{1cm}$ is taken as unity, hence a visual angle of less than 40°. This unit was chosen quite arbitrarily because of its convenience in calculation and does not indicate the normal limit as it does in the determination

of visual acuteness. White is inserted as a confusion test, and is necessary because unless the possibility of this mistake is present the most conscientious observer can never be quite positive whether he truly perceived the specific color of yellow or distinguished it from the others by the absence of color. It should be noted that it makes a great difference whether the demand is for a specific color perception alone, or for a differential separation of similar colors from each other. In the latter case green and blue are more difficult to distinguish from each other than are red and yellow. Hence a distinction between green and blue was not required, but the answer green or blue sufficed. The simultaneous use of green and blue as signal colors in practical work is excluded, while either serves as a contrast to red.

In order to approximate the conditions of practical work as nearly as possible, the duration of the observation was left to the inclination of the observer and not restricted to a fixed period. Wittich has shown that the determination of color is possible with a smaller visual angle when fixation is prolonged than when it is momentary, therefore a slight motion, so rapid as to produce only a single impression, was imparted to the object so as to cause its image to glide over all parts of the macula during fixation. But it must be remembered that in prolonged fixation antagonistic colors appear and abolish the specific perception. Hence there is a length of time which is best for the observation of each color perception and this the observer learned for himself.

Donders gives the formula $\left(\frac{r}{m}, \frac{d}{D}, \frac{a}{A}\right)^2$ as a measure for the power of distinguishing colors. In this formula m denotes the diameter of the aperture, d the distance at which the observer has recognized the color, D the distance at which it should be recognized, a the remoteness of the source of light behind the aperture, A the remoteness of the light requisite for recognition by those competent to recognize the color. In my experiments the remoteness of the source of light was a constant quantity, so the quotient $\frac{a}{A}$ disappears as a factor, and as D , the distance at which the normal eye would recognize the color, must also be con-

sidered constant the power of distinguishing colors becomes represented by $(\frac{d}{m})^2$, or by the formula given above $(\frac{D}{a})^2$, while the visual power can be calculated from the well-known formula $\frac{d}{m}$. Therefore the results gathered in the following tables must first be squared. Each figure specifies the average of ten liminal determinations. The influence exerted by smoke, fog, and clouds on the specific perceptions of color is demonstrated by the interposition of a ground glass (Ma), three milky-white glasses of different degrees of translucency (M_1 , M_2 , M_3), and two smoked glasses of different degrees of translucency (R_1 , R_2).

DR. F., NORMAL TRICHROMATE.

		Ma	M_1	M_2	M_3	R_1	R_2
Red.....	1.7	2	0.8	0.6	0.3	2	0.8
Green.....	1.8	2	1	1	0.6	2	0.9
Yellow.....	9.	4.8	3.4	2.6	1	3.4	1

DR. L., NORMAL TRICHROMATE.

		Ma	M_1	M_2	M_3	R_1	R_2
Red.....	1.7	2.4	0.8	0.7	Not tested.	2.4	Not tested.
Green.....	2.5	2.4	1	1.5		2.3	
Yellow.....	6.8	6.	2.6	2.5		3	

DR. GUTTMANN, ABNORMAL TRICHROMATE, TYPE I.

		Ma	M_1	M_2	M_3	R_1	R_2
Red.....	1.5	0.6	0.2	0.15	0	0.8	0.03
Green.....	1.5	1.3	0	0	0	0.05	0.03
Yellow.....	6	2	1.2	0.4	0.06	4	1.5

DR. LEVY, ABNORMAL TRICHROMATE, TYPE II.

		Ma	M_1	M_2	M_3	R_1	R_2
Red.....	0.3	0.25	0.02	0	0	0.1	0
Green.....	1.2	0.6	0.2	0.075	0	0.8	0.1
Yellow ..	1.8	0.9	0.25	.02	0	0.6	0.15

These results which I obtained in the normal cases are not exactly parallel to those obtained by Aubert and Wittich who made investigations along the same line. Neither these authors nor I tested with spectral colors, because such a test would not be useful from the practical point of view, and therefore it is probable that the tone of the pigment colors used in the tests was not quite the same. In order to render the yellow of about the same brightness as the other colors I had to darken it by placing several yellow glasses over each other and then add smoked glasses. This combination gave a brownish character which readily evoked the specific impression of yellow when it was contrasted with a colorless light. Other incommensurable factors are the different saturations and the never absolute equality of the clearness of the colors. The condition of adaptation of the eyes also plays a part, but this should not be rated too high in this case where dependence was placed on the foveal region alone. The possibility that the degree of adaptation would become too great through a prolonged stay in a dark room was always guarded against by lighting the room after each separate test.

We can therefore make comparisons which are free from objection only between the results obtained under the same conditions in the two normal cases, and these agree with each other very well. The subnormal appreciation of the first type of abnormal trichromates for green and of the second type for red is also evident. The chance that an abnormal trichromate will recognize a color correctly is influenced unfavorably by a diminution of its clearness as well as by a reduction of the visual angle. In the first type the liminal value for green is only slightly less than in the normal and only to the same degree as for yellow and red, but if the intensity of the light is lowered by the interposition of a slightly milky (M) or a slightly smoked (R) glass, which in the normal necessitates simply a little larger visual angle, the abnormal is either unable to distinguish the color, or is able to do so only by means of a very large visual angle.

The second type, as represented by Dr. Levy, shows a

markedly subnormal appreciation of red, which increases as the brightness of the light is lowered.

Through the kindness of Professor Nagel I was enabled to use as tests also the green and red signal disks which are used at the present time on railroads. These were illuminated by oil lamps placed behind them. I obtained the following results:

	Normal	Abnormal Type I.	Abnormal Type II.
Red	8	1.3	0.6
Green	7	3	1.7

Both of these colors could be recognized at a much greater distance than those which I had chosen, and the sub-perception of the abnormal is not only also evident, but it impresses itself even more strongly. The question whether this subnormal appreciation renders a person unserviceable for work on a railroad can be answered only with regard to each individual case, because there are great differences between the individual abnormal trichromates. As a preliminary it must be determined with certainty what is the minimum power of color distinction necessary for railroad service. This minimum has been accurately determined regarding visual acuteness on the basis that the arm of a signal post can be recognized in cloudy weather at the distance of at least 1000 metres, which corresponds to a vision of $\frac{2}{3}$. No such determination of the power to distinguish colors has been made, it may be because too many variable and incommensurable factors need to be taken into consideration. But as the colored signal lanterns, which at night take the place of the signal arms, have apertures measuring 15cm in diameter and must be recognized at the same distance, 1000 metres, an ability to distinguish colors of 6.7 is necessary, according to the calculations we have given above. Even though the abnormal trichromates may be able usually to guard against mistakes in practical work by the recognition of colors through secondary distinguishing

marks in the same manner as dichromates, yet after it has once been officially acknowledged that a good power of distinguishing colors is a preliminary requisite of those who seek service it will be concluded that these two abnormal types do not meet the demand.

In conclusion, I wish to thank Professor Nagel, who suggested this investigation to me, and furnished all the necessary apparatus, and the gentlemen who have supported me faithfully in these tedious and wearying tests.

HÆMOLYTIC INJECTIONS FOR RECURRENT HEMORRHAGES INTO THE VITREOUS.

BY PROFESSOR ELSCHNIG, VIENNA.

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AT the thirty-first meeting of the Ophthalmological Society of Heidelberg, in 1903, Roemer demonstrated that an almost immediate disappearance of blood from the vitreous of rabbits' eyes could be brought about by the injection of serum obtained from guinea-pigs, hæmolytic for rabbits' blood. As the operation is harmless when performed with modern asepsis, he recommended that it be tried in hæmophthalmos.

Some months later I was enabled to try this method on a diseased human eye, and, although the result was bad, I publish the case as the first one, to the best of my knowledge, in which the attempt has been made.

R. A., thirty-four years old, consulted me December 18, 1903. In February, 1903, while suffering apparently from a cold in the head, he suddenly noticed a black spot in the field of his left eye. It moved freely with the ocular movements, increased rapidly, and at the end of about four months he had only perception of light in that eye. In May of the same year his right eye became similarly affected, and after about three months he was almost totally blind.

There was no history of syphilis. The condition of the urine and of the blood was normal. The patient was of slight build and pale, but healthy. He had never had any severe illness, with the exception of children's diseases. A careful physical examination

revealed a slight thickening of the walls of the peripheral arteries and a slight arrhythm of the heart's action. Both eyes were externally normal.

In the left eye, a dark red reflex could be obtained from deep in the vitreous with the ophthalmoscope. In the extreme periphery alone, the dark red mass of blood was changed into small balls, which moved with the motions of the eye and permitted the bright red fundus to be seen between them. In the upper periphery, whitish, reflecting membranes and cords could be seen between the hemorrhages. Below, the retina appeared to be detached. The tension was normal, the vision perception of light, the projection faulty above. In the right eye, the condition was the same except that no cords or membranes could be seen in the vitreous and that there were no signs of retinal detachment. There were good perception of light and normal projection.

As I considered the left eye lost in any event on account of the retinal detachment, I resolved to try upon it the hæmolytic serum, and did so December 22, 1903. Dr. Sternberg obtained for me some of the hæmolytic immune serum of rabbits used in the sero-therapeutic institute of Professor Paltauf in Vienna, tested it bacteriologically, and found it free from germs.

Under cocaine anæsthesia an incision was made in the lower temporal quadrant of the ocular conjunctiva, in the region of the ora serrata, perpendicular to the margin of the cornea. The upper lip of the wound was retracted, and a puncture made in the sclera at a little higher level, through which the needle of a hypodermatic syringe was passed into the deep part of the vitreous. Some bloody serous fluid was first withdrawn, and then about an equal quantity of the hæmolytic serum injected. A bandage was then applied. The entire operation was performed under the most rigorous asepsis.

During the afternoon of the same day there were a slight chemosis and much injection of the ocular conjunctiva with ciliary injection. The pupil was small and contained a delicate coagulum of fibrin. After the pupil had been dilated with atropine, a grayish reflex could be obtained from deep in the vitreous. No blood could be seen. The tension was slightly increased. No perception of form; projection uncertain.

During the following day, a severe plastic iritis developed, with great œdema and injection of the ocular conjunctiva, and a marked

ciliary injection which soon gave place to a sclerotic discoloration of the circumcorneal zone. The vision had fallen to uncertain perception of light. The iritis fluctuated in intensity, but the pupil could no longer be dilated; a slight hypopyon appeared, the tension was plus, and the pain was increasing. Treatment was of no avail. The cornea became hazy; the circumcorneal zone of the sclera began to become ectatic on January 12, 1904, the anterior chamber gradually became shallower; there were a gray appearance in the pupil, and complete blindness. The eye was enucleated January 18, 1904. The entire circumcorneal zone was so ectatic that the enucleated eyeball appeared to be pointed.

The eyeball was placed in formalin for forty-eight hours, and the upper third then cut off by an incision parallel to the horizontal meridian, and used for bacteriological examination. The rest of the globe was hardened still more, then embedded in celloidin, and cut into sections.

The search for bacteria was fruitless.

The histological condition was as follows. The epithelium of the cornea was changed inasmuch as the foot cells were irregularly cuboidal and the greater part of the middle layers scarcely distinguishable from the superficial. Leucocytes, nearly all mononuclear, were scattered between the epithelia. The formation of acantholytic vesicles could be seen only here and there.

In the central part of the parenchyma of the cornea there was only a slight increase of the normal cellular elements, with an occasional mono- or polynuclear round cell. In both the superficial and middle layers of the marginal portion there were lines of spindle-shaped and round cells, for the most part along little blood-vessels. There were numerous cells, both resembling the normal ones of the parenchyma and round ones with well stained round nuclei and large bodies of protoplasm which contained granules easily stained by eosin, particularly in the lines of cells already mentioned. In many places the parenchyma had a well-marked fibrillary appearance, while between and in the lamellæ were small spaces filled with finely granular masses scarcely stained by eosin. Coherent lines of red blood corpuscles penetrated into these spaces in the marginal portions. The endothelium

of Descemet's membrane was absent in places, and where present the cells were apparently smooth, the nuclei badly stained. Descemet's membrane was almost everywhere covered by a more or less thick layer of round cells, mingled with apparently swollen, badly stained endothelial cells and numerous red blood corpuscles. Toward the bottom of the anterior chamber there were large masses of coagulated albumin poor in cells on both the posterior surface of the cornea and the anterior surface of the iris.

The conjunctiva and episclera were much thickened, very rich in broad, thin-walled blood-vessels, between which the tissue was thickly permeated by polymorphous round cells, most of which were mononuclear plasma cells and cells easily stained by eosin, together with circumscribed areas of red blood corpuscles. In the circumcorneal zone this tissue merged with no distinct demarcation into the sclera, which was likewise infiltrated with round cells. The diffuse increase of nuclei diminished farther back in the sclera, but everywhere the vessels and nerves were closely surrounded by round cells.

The iris was pressed closely against the posterior surface of the cornea at its ciliary margin, its parenchyma was thickly permeated by round cells, almost exclusively mononuclear, which were particularly dense about the numerous dilated blood-vessels. Pigment cells and cells filled with granules easily stained by eosin were sparsely scattered. Typical stroma cells could not be distinguished, but between the round cells were pale, spindle-shaped nuclei often in large bands and islands. The sphincter cells were in large measure undergoing hydropic fatty degeneration.

A tissue with many thin-walled dilated blood-vessels, which could be distinguished from that of the iris itself only by the scarcity of the young connective-tissue cells, extended over the pupillary margin and occluded the pupil. Toward the anterior chamber it was for the most part covered by a loose mass of coagulated albumin and round cells. Posteriorly it lay on the anterior capsule of the lens and extended between this and the iris in all directions to the ciliary body, enveloped the equator of the lens, and left only two-thirds of

its posterior surface free from this thin mantle of slightly vascular tissue. The ciliary processes were so involved in this young connective tissue that only islands and lines of epithelium showed their position and extent. So far as demonstrable, their tissue was densely infiltrated by round cells, their vessels very numerous and dilated. The neoplastic tissue then extended over the non-plicated part of the ciliary body, the epithelium of which was partly involved in this new tissue, partly absent, so that the pre-existing tissue presented numerous large and small circumscribed patches directly continuous with the new tissue with interchange of vessels. In the ora serrata the retina was involved in the new tissue. Toward the vitreous there was no clear line of demarcation, but delicate bands of spindle-shaped cells shot from it into the adjoining vitreous, which was densely infiltrated with round cells, mostly mononuclear. The vitreous had retained its structure best in the portion immediately adjoining the lens. Its fibrillation was very marked, but was fairly regular, and numerous well preserved vitreous cells, as well as cells easily stained by eosin, were demonstrable. Farther back were many large and small spaces separated by cellular bands resembling connective tissue and containing amorphous masses of albumin. Toward the ora there was an extensive region in which it consisted entirely of thick, almost colorless, swollen cell nuclei, near which again there were places which contained finely crumbled masses of broken-down, dark-colored nuclei. In several places, particularly near the retina, the vitreous was permeated with red blood corpuscles, which were for the most part disintegrated. The middle of the vitreous consisted of coagulated albumin extending laterally to the retina and penetrated by the cords already described, which were thicker where they joined the retina. Toward the papilla there were increasingly large collections of well preserved red blood corpuscles, and then the vitreous merged, with no distinct line of demarcation except when afforded by large collections of blood, into the neoplastic tissue which covered the papilla and retina.

The ciliary body and processes, so far as they were

preserved, were pressed flat, the ciliary muscle was reduced, the vessels were dilated and abundantly contained round cells in their adventitia. The epithelium was well preserved, but swollen in many places and penetrated by the irregular cells in the perilenticular connective-tissue. At the beginning of the non-plicated portion, the tissue of the ciliary body was densely infiltrated by round cells, and the epithelium in great part was broken through so that vessels and cell bands passed from the ciliary body into the neoplastic tissue of the vitreous. The adjoining choroid was likewise densely infiltrated as far as the optic nerve with round cells, almost all mononuclear, and transition forms in spindle-shaped elements, beneath which were numerous cells easily stained by eosin and resembling plasma cells. The suprachoroidea with the large- and medium-sized vessels was chiefly involved, while the choriocapillaris in general and the pigment epithelium were intact. In front of the equator alone, the choriocapillaris was defective in places, the lamina vitrea and the pigment epithelium were broken through, and a very cellular young connective-tissue arose out of the choroid. This was particularly marked in the lateral portions of the eyeball, where over large areas the irregularly degenerating pigment epithelium was covered by young cellular connective-tissue, continuous on the one side with the similar tissue which occupied the ciliary region, and on the other with the circumscribed places in the choroid just mentioned. The choroidal vessels were large, filled with red blood corpuscles, their walls only a little thickened, their adventitia very cellular.

The fibrous body of the crystalline lens which had a nearly normal appearance was separated from the posterior capsule by a finely granular mass, faintly tinged with eosin, which contained here and there Morgagni's spheres. The nuclear zone was atrophic, but the cells of the anterior capsule formed a single layer of very flat cells which extended nearly to the posterior pole as a covering for the posterior capsule.

The retina was totally detached, but, with the exception of its lower portion, it was separated from the choroid by a distance of only two or three millimetres. This space was filled mainly by an amorphous mass of albumin, partly by

young connective tissue lying on the choroid, which was particularly extensive medially and found elsewhere only in the region of the ora serrata. The histological condition of the retina was very variable. Near the papilla it was much folded, as is usual in detachment, so that very intricate pictures were formed on the slides. A layer of nerve fibres was present only in the zone immediately about the papilla. The retinal funnel was filled by a very cellular young connective tissue which merged on all sides with the retina, to a great extent took the place of the absent layer of nerve fibres, and was inseparably connected with the vitreous which was infiltrated with round cells. In this region alone the retinal layers were recognizable as such, though often drawn asunder or pressed together by the folding of the membrane. In this region alone there were present in the layer of nerve fibres as in the papilla numerous dilated blood-vessels with very thick cellular walls, in the adventitial spaces of which, and in the neighboring tissue, round cells were thickly crowded. There were also thrombosed or obliterated vessels with the same condition of their walls.

Closely adjoining there were larger places in which the retina consisted of a laminated tissue occupied by almost colorless, swollen nuclei. In its deeper layers were hyaline stratified masses of coagulated fibrin, in the inner layers of which were numerous dark-colored fragments of nuclei. At these places the necrotic retinal tissue could not be clearly distinguished from the adjoining vitreous. There were both fresh and old hemorrhages, particularly about the well preserved central tissue, and in one place adjoining the neoplastic tissue of the retina and papilla delicate loops of vessels almost destitute of walls penetrated into the necrotic focus.

The important changes in the greater part of the retina were confined to its cerebral layer, were most marked in its lower and lateral portions, and resembled those produced by embolism of the central artery of the retina. The layer of nerve fibres, the layer of ganglion cells, and the internal granular layer were changed into a finely granular laminated tissue containing pale, almost colorless nuclei and intensively stained round cells. The inner nuclear layer was thinned

more than one-half, and apparently was composed wholly of the nuclei of Mueller's radiating fibres; the outer layer was but little diminished and was of nearly normal structure. In the uniformly laminated tissue there were in many places obliterated vessels without nuclei, which could be stained and recognizable wholly by the arrangement of the tissue strata, a condition not met with in embolism, and very few obliterated vessels with thick walls rich in nuclei and enveloped in round cells. In the upper and median portions of the retina the necrosis of the cerebral layer was less marked, but nowhere did the layer of nerve fibres contain nerve fibres, and only scattered pale, large nuclei remained as traces of the large ganglion cells. At such places alone could still be found blood-vessels with mantles of round cells.

In the region of the ora the retina consisted of a vascularized cellular tissue, which merged with the young connective tissue already described as filling the anterior part of the vitreous. The layer of rods and cones had disappeared; the only traces to be found consisted of swollen bulbous or laminated formations on the external limiting membrane.

The papilla could not be clearly distinguished. Into its central portion penetrated the cellular tissue which filled the retinal funnel; its periphery was reduced and formed by a fibrous tissue which contained apparently degenerated nerve fibres with pale, often scarcely stainable tongues of cells, and was infiltrated here and there with round cells. The vessels' walls were thickened and surrounded by thick sheaths of round cells. Beyond the lamina there was an interstitial neuritis; the bundles of nerve fibres at first, especially in the middle, were so worn away that the broad septa, infiltrated with round cells, were brought almost into contact. Laterally and farther back the bundles of nerve fibres were looser and in great part degenerated, but with increasingly numerous well preserved nerve fibres. There was a severe perineuritis.

To briefly recapitulate, there was a very severe plastic iridocyclitis with scleritis which, even without the negative testimony of the bacteriological examination, evidently was not of infectious origin, for in spite of the acute character of

the inflammation the neoplastic tendency was pre-eminent, while all signs of suppuration were completely wanting. In the retina, necrosis was pre-eminent and occurred in two forms, diffuse and circumscribed. The diffuse form was the more extensive, and involved the cerebral layer of the lateral and lower portions of the membrane, where it produced an appearance which resembled that produced by a not too old embolism of the central artery. But in embolism the vessels for the most part persist either partly or wholly obliterated, while in this case the cellular elements of the thrombosed or obliterated vessels could scarcely be stained, so that their sclerotic walls could be distinguished only by their forms from the laminated tissue in which they were embedded. The circumscribed form of necrosis, which exactly resembled coagulation necrosis, was met with only near the papilla, where it involved the entire thickness of the retina, so that, although the tissue was somewhat thickened, the layers could not be recognized. In close proximity to these circumscribed areas the retina was densely infiltrated with round cells and, in the deeper layers, with a network of fibrin and hyaline-like masses. There was proliferation of the retinal tissue, particularly of the inner layers, only on the papilla and in its immediate neighborhood. This form of retinal necrosis seems to me to furnish the key to the explanation of the whole clinical picture.

The affection of the choroid, which was most intense in the lateral portions, was of the same character as that of the ciliary body and iris. It was a non-purulent, chronic, hyperplastic inflammation.

The condition of the vitreous was of importance only so far as the bands attached to or arising from the retina were to be considered symptomatic of a pre-existing retinitis proliferans, because such extensive necrosis is met with in other affections and after infection.

The retinal necrosis may be explained, I think, in two ways: first, as the result of great vascular changes, and, second, as the result of a direct toxic action on the part of the injected hæmolytic serum. The first explanation must be accepted, in part, at least, for the diffuse necrosis of the

cerebral layer, because this cannot otherwise be understood. The injected serum had produced a highly injurious effect on the walls of all the vessels which resulted in an extensive thrombosis of capillaries, arteries, and veins, especially in the peripheral, most poorly nourished, parts of the retina. But the circumscribed necrosis of all the layers cannot thus be explained. The retinal vessels nourish the cerebral layer alone, and therefore occlusion of the central artery produces necrosis confined to that layer. The outer layers of the retina draw their nutriment from the choroid and suffer in their integrity either slightly or not at all in so slight a degree of detachment as was present in this case. We must therefore assume that the necrosis of all the layers of the retina is to be ascribed to an action of the serum injected into the vitreous upon the cellular elements of the retina analogous to that of the hæmolysin upon the red blood corpuscles; in other words, to a toxic collateral action of the serum on the heterogeneous constituent parts of tissue. This action had affected both circumscribed places in the retina throughout its entire thickness, and also the entire layer of nerve fibres which lay nearest to the deposit of serum in the vitreous, so that the retinal vessels lying therein had been very extensively injured, the elements of their walls rendered necrotic, the vessels obliterated. These vascular changes had then, to a certain extent secondarily, caused the diffuse necrosis of the cerebral layer of the retina. Evidence in favor of the latter theory seems to me to be furnished by the fact that the retinal vessels in the periphery were almost everywhere completely necrotic, while in total embolism of the central artery of the retina the vessels' walls proliferate to complete obliteration, but their cellular constituent parts everywhere retain their normal power to be stained.

It is known that the different cytotoxines—that is, the different materials formed in animal organisms by resorption of cells which have the peculiarity of destroying the cells used in the formation of related constituent parts of tissue—have no specific action. Landsteiner informs me that even the imperfect results of certain experiments, such as to re-

establish a nephrotoxic or a hepatotoxic serum, are due to this imperfect specificity. While it may be easy to demonstrate an action in some measure specific when dealing with free cells, it is very difficult to demonstrate a characteristic action on organic cells within the organism, because the action of the serum extends to other kinds of cells as well. Thus there are doubtless in hæmolytic immune serum constituent parts which are toxic for other tissue elements than the red blood corpuscles; therefore the theory is justified that in this case the necrosis of the retina and of extensive parts of the vitreous was due to such a destructive collateral action of the injected serum.

The iridocyclitis, choroiditis, and the proliferating inflammation on and about the papilla may have resulted partly from the irritating qualities of the serum and partly from the extensive tissue necrosis which is of itself provocative of inflammation.

In spite of the bad result in this case, I would not abandon without further investigation Roemer's new therapy for hæmophthalmos, which opens up a hopeful perspective for these otherwise so often incurable cases. It is much to be regretted that as yet no other experiments have been made, or at least reported. Tertsch stated in the *Wiener ophthalmologischen Gesellschaft*, when I reported my experiment, that he had tried a similar injection in one case and that it had not been followed by any change whatever. The non-appearance of any, even the hæmolytic, reaction after the injection, although the hæmolytic power of the serum had been proved in the laboratory, suggests that no serum remained in the globe. Deutschmann used special precautions in his vitreous injections to prevent the escape of the injected fluid during removal of the syringe. Hence Tertsch's experiment seems to me to prove nothing, and mine is the only one from which to judge the therapeutic application of hæmolytic serum. Although this gave an absolutely bad result, I would plead that the procedure be not abandoned, but would beg to submit certain proposals for its prosecution with a view to the avoidance of the injurious effects which accompanied the hæmolysis, the increase of tension,

plastic iridocyclitis, necrosis of the vitreous, and necrosis of the retina.

I would recommend that the serum be used greatly diluted, say one part to ten of physiological salt solution, in order that while the hæmolytic action may be obtained the other cytotoxic components may be rendered ineffective. I would replace by serum only a portion of the fluid drawn from the vitreous in order to avoid the increase of tension. If the desired effect was not obtained at once this procedure, which is certainly harmless, could be repeated as often as desirable with solutions gradually increasing in strength and quantity. If the tension became increased, or if iridocyclitis appeared, I would puncture the anterior chamber or the vitreous in order to accelerate the removal of the injected substance. It is to be hoped that in this way Roemer's ideal may be realized.

CONGENITAL ORBITAL CYST ASSOCIATED WITH MICROPTHALMUS.¹

BY DR. RAY CONNOR, DETROIT, MICH.

(With Text-Plates I. and II.)

CONGENITAL cysts associated with microphthalmus are so rare as to justify the report of a case.

The patient, a baby of ten months, was referred to the clinic of the Children's Free Hospital through the kindness of Dr. Otto Scherer. The child was seen early in August, and advised to enter the Hospital for the removal of the cyst, as it had increased greatly of late. On examination, no malformation other than the eye condition could be found. There was no history of any deformities on either side of the family. The child was a large and healthy breast-fed infant, although the mother said he was smaller than her other children at the same age. The mother has had ten children, six of whom are still alive and well. At the birth of the child, a midwife was in attendance, and no eye could be made out on the left side. The cyst grew slowly at first, and did not come to the level of the orbital rim until the baby was four months old. Its growth became more rapid later. The right eye was apparently normal. The left orbit was filled with a large, fluctuating mass which bulged out between the lids, pressing them both forwards. The palpebral orifice was much distended by the growth, and the lower border of the bony orbit did not extend up as high as on the right side. The lower lid showed a somewhat bluish tint, and the tumor gave no sense of pulsation and could not be reduced by steady pressure. No vestige of an

¹ Read before the Detroit Ophthalmological and Otological Club, Nov. 7, 1905.

eye could be made out until the upper lid was strongly retracted, when a rudimentary ball was discovered half hidden by a fold of the conjunctiva. The conjunctiva presenting in the palpebral orifice was roughened and thickened from exposure. An X-ray, taken on the day following admission by Dr. Hickey, showed nothing of diagnostic importance.

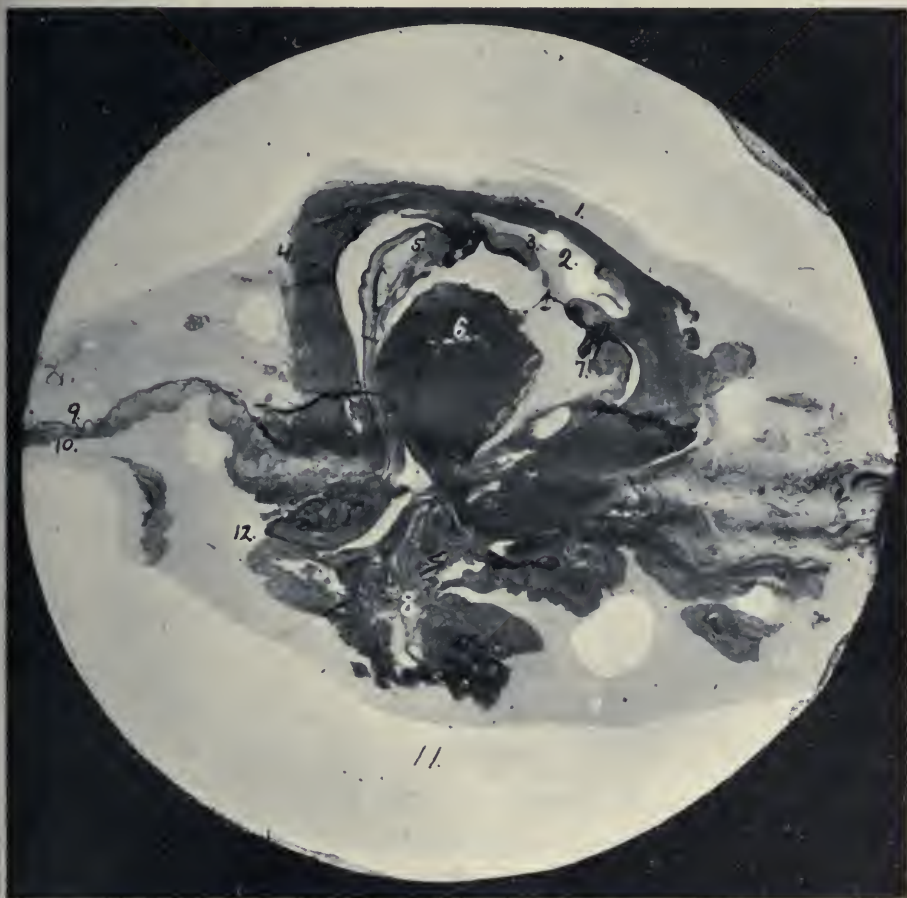
On August 8th, the cyst, together with the rudimentary globe, was excised under chloroform by Dr. Leartus Connor. The outer canthus was cut to give more room for the dissection, but in spite of care the cyst was ruptured in peeling it out and its contents escaped. The fluid it contained appeared to be reddish, but as the rupture was some distance back it may have become stained by the blood of the operation. The cyst extended back to the apex of the orbit, but was not adherent to the surrounding tissues and was completely removed. The extrinsic ocular muscles seemed very much hypertrophied, especially as contrasted with the rudimentary globe. There was little hemorrhage following the operation, and the child made a good recovery, being discharged from the hospital about a week later. The orbit filled in well, and about a month later a small ball of iodoform and paraffin was inserted in the orbit to keep the cavity from filling up. He was later discharged, wearing the ball and with the orbit lined completely with conjunctiva.

Through the kindness of Dr. Leartus Connor, I had the opportunity of studying the specimen. When filled with fluid the tumor measured $4\frac{1}{2}cm$ laterally by $3\frac{1}{2}cm$ vertically and $3\frac{1}{2}cm$ antero-posteriorly. While the cyst had several diverticula, the communication between them was very free, and one puncture emptied the entire cavity. Desiring to find out, if possible, the origin of the cyst and its relation to the rudimentary globe, I dissected out that portion of the cyst wall next the globe and hardened it together with the globe in alcohol and sectioned the specimen in celloidin. The microphthalmic globe was found to be unusually well developed. The cornea presented outward and the nerve inward. The globe measured $7\frac{1}{2}mm$ antero-posteriorly by $10mm$ laterally. The anterior part of the ball was the most nearly like a normal eye. The front of the globe was somewhat flattened, and the anterior chamber was $7mm$ across. The cornea was well developed, although much thinner than the sclera and traversed by blood-vessels in the substantia propria. The sclera was relatively thick, reaching $1\frac{1}{2}mm$ in thickness.

ILLUSTRATING DR. CONNOR'S ARTICLE.



ILLUSTRATING DR. CONNOR'S ARTICLE.



MICROPHTHALMIC EYE SHOWING THE COMMUNICATION BETWEEN THE CAVITIES OF THE
GLOBE AND THE CYST.

- | | |
|----------------------|---|
| 1. Cornea. | 7. Ciliary Processes. |
| 2. Anterior Chamber. | 8. Folding of Cellular Lining of the Cyst. |
| 3. Iris. | 9. Outer Fibrous Lining of the Cyst Wall. |
| 4. Sclera. | 10. Inner Cellular Lining of the Cyst Wall. |
| 5. Retina. | 11. Cavity of the Cyst. |
| 6. Lens. | 12. Cleft Connecting the Two Cavities. |

The anterior chamber was well formed, and no coloboma of the iris was present nor were there any remains of a pupillary membrane. The iris was fairly well developed, and the ciliary processes were relatively hypertrophied as compared with the rest of the globe. The lens was well formed, nearly round, and contained in the cavity of the globe which it about filled. No zonula fibres were to be seen. Inferiorly the sclerotic coat was open and some of its fibres were continued to form the outer wall of the cyst which at some points was quite thin. No bone or cartilage was present in any of the sections studied. The posterior layer of the iris, as well as the ciliary processes, was heavily pigmented, and some of the pigment could be found in the inner wall of the cyst, many of whose cells contain similar pigment granules. The cyst wall was composed of two layers: an outer thin and fibrous, continuous with the scleral wall of the globe; and an inner thicker and much more cellular, continuous with the inner layer of the globe and representing modified retinal tissue. Just where the cyst is in connection with the globe, the inner lining of the cyst is thrown into many folds, giving a papillomatous appearance. A narrow but clear communication can be demonstrated between the cavities of the cyst and globe.

The rarity of these cases is well shown by the fact that only about fifty-seven of them can be found in the literature as far as I have been able to ascertain, and this includes cases associated with anophthalmus as well as microphthalmus, as it is almost impossible to separate these. Several of the cases which were originally thought to be anophthalmic were found to be microphthalmic after the evacuation of the cyst. In an excellent resumé on the subject by Mitvalsky,¹ published in 1890, the notes are given of thirty-eight cases gathered from the literature in addition to two of the author's published for the first time. Since this date I have been able to find seventeen more cases. The first case of the kind on record is one of Arlt's,² published in 1858. De Wecker³ reported a case, and was the first to point out the similarity between the aspirated contents of the cyst and the aqueous humor. Talko⁴ studied eight cases, mostly in infants. Manz⁵ published two cases, as did Snell,⁶ but most of the authors have had but one case to their credit. The

topic has formed the title for three inaugural dissertations, and has given rise to considerable difference of opinion as to etiology.

Since 1890, Gailemaerts⁷ has reported a case with a microphthalmic eye and a large orbital lower-lid cyst whose wall consisted of two layers, an outer fibrous and an inner granular, but not clearly defined.

E. Treacher Collins⁸ has recorded a case of a small eye associated with two cysts in a man of eighteen years. In a later communication, the same author reported three more cases, the first in a man of twenty-eight years, whose right eye had been small and shrunken since birth and had now become painful. A cyst somewhat larger than the globe and connected with it was filled with altered retinal tissue. The second case was a boy of fourteen weeks, whose left eye was shrunken and had cartilage attached in front above and a cyst below and behind. This cyst was about the size of the globe and consisted of two coats, an outer fibrous, continuous with the sclerotic, and an inner, of ill developed retinal tissue, whose inner surface was directed outward and outer surface inward. The third case was a girl of twelve years, born with a defective right eye. A small eyeball with a cyst attached posteriorly and a little to one side was removed. Behind the lens the interior of the globe was filled with a folded membrane. The cyst had an inner, folded lining membrane, continuous with the folded membrane inside the globe. There was some bone on the inner surface of the choroid near the neck of the cyst.

Snell⁹ published three cases in addition to those included in his earlier communication. One was a child of three months with a normal right eye and a cyst in the left lower lid, extending well back into the orbit, but no eye could be found. A second case, in a child of six weeks, had a cyst in the upper lid, and no globe could be demonstrated. In the third case, a child of ten months, the cyst was in the lower lid and associated with microphthalmus. It however swelled up on crying and seemed to pulsate synchronously with the frontal fontanelle.

Thalberg's¹⁰ case was a child of two years, with a microph-

thalmus where the globe was pushed upward and somewhat inward by a partly solid and partly cyst-like tumor, which originated in the sclera and extended to the inner-lower angle of the orbit. The left eye, as in so many of these cases, showed a coloboma of iris and choroid.

Fromaget¹¹ described an orbital cyst causing protrusion of the lower lid and associated with microphthalmus. It had three divisions, a stalk extending toward the optic foramen, a smaller anterior cyst, whose outer wall resembled the cornea, lined with a pigmented membrane and containing an opaque lens, and a middle large cyst united with the stalk by a narrow opening and lined with mucous membrane.

Bernheimer¹² reported a six-weeks baby with hydrocephalus and microphthalmus, with small cyst below and behind the globes.

Becker's¹³ case was a boy, aged six months, with a tumor lying beneath the conjunctiva of the lower lid, filling the entire palpebral fissure and pressing the lower lid forward. The tumor was translucent, fluctuating, and as large as a pigeon's egg. The eyeball was small and cornea opaque. The child was otherwise healthy. In this case there was a communication between the eyeball and cyst through a cleft in the former, and through this a fibrous tissue rich in cells passed from the interior of the ball into the interior of the cyst.

In this country, Harlan¹⁴ has reported two cases. In one, the left eye was normal, and the tumor was about the size of a small hen's egg and completely filled the orbit. No evidence of an eye was found when the tumor was enucleated. The patient died presumably from shock. A peculiar tissue was found in the tumor, which resembled atypical cerebral tissue, and which contained the typical perivascular spores about the blood-vessels and nerve nuclei corresponding to those of the neuroglia. The other case is more typical. The patient was a girl of seven, without other history than that the tumor was supposed to be congenital and thought to be increasing in size. The left lower lid was pressed forward by a large incompressible but tensely fluctuating cyst,

the bluish color of which was evident through the thin skin. The tumor was 40mm by 25mm, and the lower margin of the orbit was 5mm below the level of that of the other eye. At the bottom of a deep conjunctival sac above the cyst, a rudimentary eyeball, apparently scarcely larger than a pea, which moved freely in unison with the other eye. The right eye was perfect and no other abnormality could be found elsewhere. The cyst was removed without difficulty although it reached the bottom of the orbit. It was filled with a clear yellowish fluid, but no connection with the rudimentary globe could be demonstrated.

Hoppe¹⁵ has recently described two cases, one an infant six days old, whose right lower lid was distended with a cyst, and at the bottom of the right orbit a rudimentary eye the size of a cherry was present. In the other case, a child of two years, the right eye was absent and could not be found even after puncturing the cyst.

Cruise¹⁶ has had a case in a woman twenty-four years old, who had had from birth a swelling in the left orbit associated with a microphthalmic eye pushed into the upper and outer quadrant. The orbital contents were eviscerated and during the operation some clear fluid escaped. The pathological interest centred in the very free communication that existed between the interior and exterior of the globe by a wide coloboma at the posterior pole, a condition which permitted the free passage of the fluid secreted by the well developed ciliary processes into the cyst, producing the increase in size which necessitated operation.

Various theories have been advanced in order to explain the origin of these congenital cysts. Arlt,³ from a study of his first case, thought that it was due to a coloboma of the iris and choroid, with the secondary formation of a large diverticulum by the bulging of the ocular coats inferiorly. This is practically the **encysted coloboma** of later writers.

Wicherkiewicz¹⁷ held that as a consequence of the void occasioned in the preformed orbits by the total absence, little development, or intrauterine resorption of the globe, the eyelids yield to the external pressure and turn themselves into the empty cavities. As they do not fill the void, there

is formed in the cellular tissue of the lower lids a serous transudation, to fill the void in question. The liquid encysts itself in a membrane from the connective tissue in its own immediate neighborhood. Subsequently the cysts, partly from their own weight and partly by the dragging of the orbicular muscle, detach themselves from the internal wall of the orbit.

Chlapowski's¹⁸ case was considered as an atheromatous cyst.

Talko⁴ thought these have nothing in common with the ocular globe, and place an obstacle to a complete development of the eye or hinder its evolution completely. He seems to admit that these cysts arise in the foetus by the entanglement of the upper part of the lachrymal sac (Hoyer's hypothesis) during the process of welding the lachrymal fork, and are cysts of retention.

Berlin¹⁹ believed that it was more than a coincidence that these cysts were associated with anophthalmus or microphthalmus, and that they arose from the same embryonic tissue which normally goes to form the eyeball.

Manz⁶ thought that a scleral cyst may become greatly enlarged and cut off from the ball, so that the former communication may be represented by a fibrous cord. Since the inner scleral layers which rest on the choroid may probably be separated from the outer scleral layers by the increase in cystic fluid, this dehiscence of the scleral layers may increase in every direction, and include the greater portion of the ball. The cornea and optic nerve form the limits of such an extension.

Van Duyse²⁰ considered these cysts to have three modes of origin: First, cysts corresponding to hydrophthalmus, due to a high degree of foetal cystic degeneration of the ball, and very probably due to an intra-uterine chronic inflammatory process of the uveal tract. Second, dermoid cysts, arising from invagination of the external germinal vesicle in connection with the eye. Third, subpalpebral serous cysts, with microphthalmus or anophthalmus, which appear to be derived from an encysted coloboma. The frequent, almost constant association of these cysts with a

rudimentary or ill-formed eyeball of itself suggests some causal relationship between that condition of globe and the cyst pressing forward the eyelid. Another point is the presence of these cysts in the inferior part of the orbit and the ordinary position for colobomata of the eyeball at the lower side. He gives a table to aid in the diagnosis from meningocele.

It was Deutschmann¹¹ who advanced the theory that so-called arrests of development were only changed developments of the eye, the result of intra-uterine inflammation.

Dor²² believed that in foetal life a portion of the embryonic vitreous, having been cut off outside the ball by a premature closure of the foetal cleft, had developed into a cyst.

Kundrat²³ thought that in the genesis of these cysts the retinal tissue, *i. e.*, the tissue of the primary optic vesicle, pushing through the open foetal cleft into the embryonic tissue outside, is enclosed and cut off by the latter, thus forming a cyst. He believed the basis of this embryonic tissue to be the mesodermic tissue which should have formed the poorly developed vitreous, and the check in the development of the vitreous and in the closure of the foetal cleft was primary, and the proliferation of the retinal tissue—not simply its bulging out—was secondary.

Collins⁸ says: "In all the specimens which I have examined, the changes are best explained by considering the inner layer of the secondary optic vesicle to have become unusually rucked and folded, due to some imperfect development of the vitreous humor or delayed closure of the cleft; that, as a result of this rucking and folding, a portion of the inner layer of the secondary optic vesicle has become extruded through the foetal ocular cleft into the subadjacent mesoblast, where in some cases it has subsequently become expanded into one or more fluid-containing cysts."

Fromaget¹¹ advocates the theory that, at the time of the junction of the nasal and superior maxillary process, a bulging of the nasal mucous membrane had taken place, forming a cyst which altered the optic nerve and eyeball and produced an apparent anophthalmus.

Mitvalsky¹ concluded, from the relationships found, that the distal layer of the primary optic vesicle must have retained its original position. That no invagination occurred to form the secondary optic vesicle is shown by the absence of the lens from the interior of the ball. The scarcely recognizable rudiment of the lens has merely broken through the distal wall of the vesicle without invaginating it. Whether this has played any rôle in arresting the development of the eye is not clear. With the development of the coats of the eye went hand in hand the secretion of the ocular fluid by the well-developed retinal epithelium, and the current took the direction of the least resistance and passed into the folded products of the distal layer, developing in the neighboring mesoblast and distending it. And when a fibrous sheath had formed about these products, preventing their uniform distension, the weaker portions of the sheath yielded and a large reservoir was formed, preventing the proper development of the inferior orbital wall, and eventually pushing out into the lower lid. To support this theory, it is necessary to show that there has been no involution of the primary optic vesicle, and that it has retained its original relation to the surrounding mesoblast. The simplest proof of this is in the inverted position of the retina, which has been found in every case examined. The lens or its rudiment cannot be within the ball, but must be in the connective-tissue coat, if there has been no involution of the vesicle. Nor can such a ball contain the retina in its normal relation to the pigment epithelium. There are, however, cases of this malformation where the lens lies in the interior of the eye, and where there may perhaps be a retina of normal structure and position, the partially developed ball being in connection with cysts. In these cases, the distal wall of the primary vesicle must have become involuted in its anterior portion, forming a normal retina, while near the optic nerve it has not become involuted, and this portion must have become distended, forming a cyst. In this manner, we may explain the cases in which there is a cyst near the optic nerve of a ball that is fairly well developed.

Hess²⁴ thinks that the invagination and closure of the

secondary optic vesicle took place in a fairly normal manner. In the region of the closure, a portion of the bulbar wall had so little resistance that after the closure it yielded to the intraocular tension and became greatly distended. The outer wall of the secondary vesicle followed this distension and lined the inner surface of the cyst wall, exhibiting various changes. In regard to the old theory that a foetal sclero-chorio-retinitis is the cause of these malformations, the examination of a number of microphthalmic eyes with colobomata has shown that in many there are no indications of a recent or an old inflammation; that the supposition of slight individual differences in the development of mesodermic tissues entering the vitreous chamber through the foetal cleft is supported by many facts and many analogies in general histology, and permits the explanation of these malformations in a relatively simple way.

The case here reported seems unusually typical of this class of malformations. The microphthalmic eye is unusually well developed and the communication between the cavities of the globe and the cyst well shown. The question whether the cause of such malformations is inflammatory or not seems far from settled. We can only say not proven. That this cyst had its origin from embryonic tissue which should normally have gone to form the eye seems clear, but whether the mesoblastic origin of the vitreous is at fault or the tissues around the foetal cleft of the secondary optic vesicle, is hard to say. Hess's view would certainly seem to explain the specimen better than that of Kundrat and Mitvalsky.

The only practical consideration lies in the diagnosis from meningocele which is sometimes difficult. In this connection aspiration of the cyst and a chemical and microscopical examination of the aspirated fluid should be performed before a more radical step is undertaken, as an attempt to enucleate a meningocele might easily lead to meningitis and death. My thanks are due to Dr. Leartus Connor for his kindness in allowing me to report the case.

VAN DUYSSE'S TABLE

Fluid of Cyst (Encysted Coloboma).	Aqueous Humor.	Cerebro-spinal Fluid.	Hydatid Cyst.	Dermoid Cyst.
No formed elements. Color lemon-yellow. Very slightly oily.			Little crowns of hooklets; little sacs.	Fatty crystals, notably plates of cholesterine; fatty globules; epidermic elements; soft hair.
Feebly alkaline.	Alkaline.	Alkaline.		
By heat the fluid thickens, becomes gelatinous and milky, and the condition does not disappear with nitric acid.				
White precipitate, very abundant with nitric acid, increased by boiling (albumin).	Albuminoid matters (fibrin, etc.) very feebly precipitated by acids.	Not coagulable (according to G. Gautier).	Absence of albumin.	
White precipitate, very abundant with chlorhydric acid; application of heat causes then the coagulation of all the liquid.				
No effervescence with acids.	No effervescence with acids.	Slight effervescence with acids (carbonates).		
The addition of a solution of AgNO ₃ 1 %, produces a white precipitate soluble in ammonia, insoluble in nitric acid.	Contains 7 % of chlorides.	Chlorides absent.	Contains chiefly chloride of sodium.	
No deposit with Fehling's solution.	No effect on cupropotassic reagent.	The alcapton (Bodiker) or glucose (Cl. Bernard) contained in this fluid throws down Fehling's solution.	Often grape sugar; sometimes succinic acid (Heintz, Honij, etc.), inosite (Wright).	

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A PLASTER OPERATION ON THE EYELIDS BY MEANS OF SKIN FLAPS TAKEN FROM THE NECK.

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(With one figure in the text.)

Yetta D., is a young woman, aged twenty-two, afflicted with epilepsy; several years ago, during a fit, she fell onto a hot stove and the right side of her face was frightfully burned. She was taken to the County Hospital where she remained several months.

At the time the patient presented herself, the entire right side of the face from forehead to below the angle of the jaw was scarred and disfigured; there was complete ectropium of both the upper and lower lids; the mucous membrane of the lids was thickened and swollen, the bulbar conjunctiva was red, and the cornea slightly hazy. The pupil reacted freely, and the vision was not quite $\frac{2}{3}$.

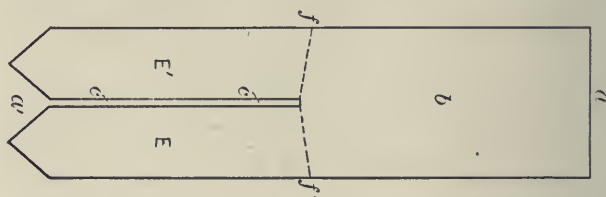
Evidently at the County Hospital the defects left by the burns had been covered with Thiersch grafts taken from the right arm, for the slightly raised skin areas, where the grafts had taken, could easily be distinguished, throughout the burned area, surrounded by scar tissue. Such grafts had been placed on both upper and lower lids, and in spite of the fact that the grafts seemed to have taken well, contraction occurred just as if no grafts were present; moreover, the grafts on the lids were not spread out evenly but were wrinkled up into a small compass so that it could easily be seen how much the grafts themselves had shrunk.

The right arm from elbow to shoulder was covered with scars where the Thiersch grafts had been cut.

The patient was very anxious to have the ectropium remedied, so an operation was decided upon, and she was sent into the Michael Reese Hospital where, with the help of Dr. Gaus, the following operative procedure was carried out:

Incisions were made parallel to the borders of both upper and lower lids, about one-half centimetre from the edge of the lid; all adhesions were then dissected out freely, and the lids put upon the stretch by suturing the upper and lower lids together.

A skin flap was then cut, reaching from just below the angle of



the jaw almost to the clavicle, the pedicle at the angle of the jaw being almost two centimetres in width.

The free or lower end of the flap was then split upwards for a distance of about four centimetres, thus making at the lower portion of the flap two distinct flaps, each united, of course, to the common pedicle (see sketch); one of these secondary flaps being intended to fill in the defect of the upper lid, the other for the lower, both getting their nutrition from the pedicle of the main flap.

The whole flap was now turned upward, and the two dependent flaps on the end were sutured into their respective places with fine silk sutures, the higher one on the upper lid, the lower one on the lower lid, great care having been taken to supply a surplus of skin for the defects to account for future contraction; this was a simple matter, for an ample supply had been easily obtained from the neck. When the flaps had been sutured into place there was a bridge of skin extending from the bases of the secondary flaps to the pedicle of the main flap at the angle of the jaw, about nine centimetres in length; this bridge was carefully protected from contact with the skin of the cheek by numerous guttapercha strips passing under it; guttapercha strips were also placed over it, as well as over the new skin of the eyelids; over this was placed plain dry gauze and a bandage applied.

By undermining the edges of the wound in the neck, I found no difficulty whatever in coapting them.

The bridge of skin passing over the cheek was allowed to remain *in situ* six days, and was then cut off; where its connection with the lid flaps was severed at the outer portion of each defect in the eyelid, after freshening the edges of the defect, the cut portions were sutured into their proper places; blood oozed nicely from the cut surfaces, and although a few of the sutures holding the flaps in place sloughed out, of the flaps themselves there was no slough whatever.

It is now eight months since the operation was performed and the result of the operation is a perfectly satisfactory one, with perhaps this exception—*i. e.*, the skin of the upper lid seems a trifle too heavy, giving the lid a slight droop; as, however, contraction at the end of eight months might still be expected I should call this an advantage rather than a defect.

As Czermak aptly says: "Every plastic operation for cicatricial ectropium of the eyelids is in a category of its own; there are no cut and dried rules which will apply to all cases or classes of cases."

In the above described case, several other procedures might have been employed. The defects of the lids might have been covered by means of Thiersch or Wolfe grafts, but where large defects of the lids are to be repaired I am thoroughly skeptic as to the advisability of employing grafts; I agree with Valude when he says it is not "*Méthode de choix*," but "*Méthode de nécessité*." I have found that not only does contraction of the deeper tissues go on just the same, but the graft itself shrinks and contracts to such an extent that I believe in many cases it actually adds to the deformity; how these cases look in two or three months is no criterion as to the ultimate outcome.

I believe most of us have observed cases where, although the graft seemed to have taken perfectly, it afterwards seemed to undergo a peculiar crusty desquamation; it then would shrivel and shrink so that anybody watching the case would be bound to conclude that the new skin had undergone actual degenerative changes.

Another method which might have been employed was the

so-called Italian method (Branca, Tagliacozza, von Graefe); immobilizing the arm to the side of the head, suturing a flap from the arm to the eyelids, leaving the pedicle attached to the arm till nutrition was established, and then severing the connection; this procedure, however, is far more difficult of execution, causes severe discomfort and suffering to the patient, and, on account of difficulty of perfect immobilization and sterilization, far more dubious as to the outcome than the method employed. It is true the Italian method causes less disfigurement, but this hardly enters into the question as the long scar on the neck is almost entirely concealed by the collar.

In some cases the neighboring scar-tissue forms useful material for flaps; here, however, on account of the extent and severity of the injury it was hardly to be considered. An objection which might be made against using skin flaps from the neck is on the score of its wastefulness, the entire bridge from the angle of the jaw to the defect in the eyelid being cut off when nutrition is established; this is, however, hardly a valid objection as the loose skin of the neck affords more than an ample supply, it being, moreover, an easy matter to close the defect in the neck without putting the least tension on the skin.

In the case described, I found this method so easy to employ, so satisfactory, and, moreover, so little productive of deformity, that although I employed it here almost through necessity, in the future where large defects of the lids are to be remedied I should employ it as the operation of election, even though the skin of the face were well adapted for plastic purposes, because it is just as easy of execution as if the skin were taken from the face, it produces far less deformity, and if the flaps should slough far less damage has been done than if we should lose flaps taken from the face. Moreover the loose skin of the neck is far better adapted for plastic purposes on the eyelids than the thicker skin of the face and forehead.

MEETING OF THE OPHTHALMOLOGICAL SECTION OF THE BRITISH MEDICAL ASSOCIATION, AT LEICESTER, WEDNESDAY AND THURSDAY, JULY 26 AND 27, 1905.

WEDNESDAY, JULY 26TH. DR. G. A. BERRY, PRESIDENT, IN THE CHAIR.

The President in opening the work of the Section reviewed in brief the recent progress of ophthalmology, after which the following papers were read.

Dr. A. BRONNER (Bradford) read notes on a case of **emmetropia** in which distressing local and general symptoms had been relieved by the use of — 1 D spherical with — 1 D cylindrical glass.

He referred to the many cases that every one is familiar with, in which the correction of small errors of refraction had relieved local and general symptoms, and to the still more marvellous cases that were frequently seen reported in the lay press. In America, heterophoria is the cause of many of these wonderful symptoms, and in England slight errors of refraction are said to produce them. The case here recorded is one which shows how careful we should be in believing the statements of patients and how the use of glasses which are absolutely wrong can produce the same results. The patient was a man aged twenty-four, who came to Dr. Bronner, stating that the glasses he was wearing were simply wonderful and he required no alteration in them, but he wished to know whether, if he left them off, it would cause injury to his health, as they interfered with his promotion in business. Before he wore glasses, six years ago, he had been in indifferent health and was unfit for work. He also suffered much from headaches. He had always seen fairly well at a distance, but had to bend his head much in reading. As soon as he began to wear glasses, all his distressing symptoms disappeared and he gained several stones in weight. On examination he read $\frac{6}{8}$ and J i with difficulty with his glasses, $\frac{6}{8}$ and J i easily without them, and with — 0.5 $\frac{6}{8}$. The disks were congested and both eyes practically emmetropic. He was wearing spherical 1 D and cylindrical — 1 D. In this case the cure was obviously due to suggestion

only, and possibly was assisted by the fact that with the glasses he was obliged to hold his head up when reading.

This case shows how careful we should be to examine all eyes thoroughly, for it is certain that such a case as this one could quite well have been cured by atropine and by holding up the head when reading.

MR. E. E. HENDERSON read a paper on the effect of **atropine and eserine on the filtration of fluid through the eye**. The apparatus employed was slightly modified from that previously used, a description of which was published in the *Journal of Physiology* in a paper by him and Professor Starling. The fluid used was normal salt or Ringer's solution which had previously been filtered through a Berkfeld candle. On raising the pressure in the living eye, a certain rate of filtration was observed and recorded by the scale attached to the tube. This rate increased with the pressure and was due partly to increased filtration and partly to diminished production of the normal intraocular fluid. This rate depended on numerous factors, some of which had been noticed by other observers. There was one factor of which they had previously met with no account, and that was the rate of filtration of fluid when the eye was under the influence of atropine or eserine. The rate of filtration at artificially raised pressures was found to be considerably larger in the eye under eserine than when under atropine. That this effect was not purely mechanical was proved by the free filtration that was observed after death. Possibly at these high pressures other channels were opened in the eye when the pupil had been fully contracted with eserine, as, for instance, the surface of the iris.

The following are figures taken from a typical experiment.

Cat anesthetized with ether.

Blood pressure—average 138mm and varied very slightly throughout the experiment.

Intraocular Pressure.	Rate of filtration in eserine eye in cubic mm per minute.	Rate of filtration in atropine eye.	Rate of filtration in atropine eye immediately after death.
26.	0.	0.	15.
46.	11.	8.	20.
66.	16.	11.	25.
86.	23.	14.	31.

It will be noticed that the intraocular pressure is the same in both eyes, namely, no filtration took place in either eye at 26cc pressure.

Mr. BISHOP HARMAN read notes on the **result of electric treatment of trachoma as practised at the Middlesex Hospital**. Some cases had been treated with X-rays, others with high frequency currents, and others with radium. The results in all were most unsatisfactory, and none of them did anything like so well as when treated with the more usual applications such as copper or silver.

Mr. DEVEREUX MARSHALL agreed with what Mr. Harman had said, and he stated that his own experience of X-rays and radium had not been by any means encouraging, and he much preferred applications of copper or silver.

COLONEL DRAKE-BROCKMAN said that he was pleased to hear the views expressed by the reader of the paper and Mr. Devereux Marshall. He had watched with interest all that had been published on the subject, and was not satisfied with the results that had been given. He had himself always relied on therapeutic application for the relief of trachoma. He had more recently used argyrol and cuprol with massage, a plan of treatment which was painless and excited no terror in the minds of patients. He had now abandoned the more powerful and caustic remedies which were formerly so much used. The President and Dr. Bronner also took part in the discussion.

Mr. BISHOP HARMAN described a case of **false hay-fever**. It occurred in a lady who never had a sign of hay-fever until she went to reside in a district surrounded with pine trees. She then suffered severely. The usual remedies did little or no good. Mr. Harman then examined her eyes and found some astigmatism which he corrected. Since that time the symptoms completely disappeared. He ascribed this to the fact of unequal refraction setting up an irritation on the retina, which by a reflex action stimulated the fifth nerve.

Mr. DEVEREUX MARSHALL asked how, if Mr. Harman's theory was correct, he could account for the fact that such patients suffered only in the spring, when the light was as strong or stronger later on in the summer, and nearly always was so at sea, when such patients never suffered in this way.

Mr. HARMAN, in reply, said that the retina got more accus-

tomed to the light than it was when the eyes had been used to the dull light of winter.

Dr. KARL GROSSMAN (Liverpool) gave a lantern demonstration of **lepra ophthalmica**. He showed a large number of colored photographs, which he had taken in Iceland, of patients suffering from leprosy, which showed in a remarkable manner the lesions caused by the disease.

Dr. KARL GROSSMAN recorded a case of **congenital absence of the dilator of the pupil**. The patient was a little girl, aged five and a half years, quite healthy in every respect, and well developed mentally and physically. The right pupil was eccentric and almost slit-like, its position being upward and inward. The iris was tremulous, and careful examination showed that the lens was absent. After atropine the pupil became a mere shade wider than before, and a small moving mass was visible behind the lower margin of the pupil. This was evidently a rudimentary lens; there was no trace of capsule seen in the pupil. The fundus appeared to be normal, and after eserine the pupil contracted to a narrow slit. The left eye showed the same condition, with the exception that the lens was not visible at all. The effect of eserine showed that the sphincter was present, but the very slight effect of atropine was due to the paralyzing effect upon the sphincter. There were no posterior synechiæ present. Dr. Grossmann knew of no similar case on record.

Dr. GROSSMAN also read a paper on the **treatment of conical cornea by the hot-air cautery**. He pointed out that any form of red-hot substance had the disadvantage of causing necrosis of any tissue it touched, and in addition it was difficult to accurately regulate the temperature. This could be more satisfactorily obtained by superheated air, as employed in an instrument devised by Dr. Hollander, of Berlin. It consisted of a Paquelin cautery, in which was a platinum coil, the air in the coil was heated by the Paquelin, and the rubber tubing was so arranged that the same set of bellows which supplied the cautery sent an ordinary fresh in-current through the heated metal coil. He had used this cautery for various eye and lid diseases, and particularly for conical cornea. In operating for this, the stream of hot air was allowed to fall upon the apex of the cone. In order to keep the instrument absolutely steady, a transparent shield of mica was used, through which the point of the cautery could

project. Care should be taken not to do too much, for the hot air dries up the epithelium all round, but this rapidly regains its normal transparency. He had used it on five cases with satisfactory results.

A demonstration of the instrument followed.

Dr. CECIL SHAW (Belfast) read notes on a case of **toxic amblyopia**. The patient, a man aged twenty, was first seen by him on February 10, 1905, on account of sudden failure of vision. He was a carpenter, and a fine, healthy-looking man, with nothing of note in his family or personal history. Five days before, he had an attack of influenza; on the seventh he rode out on a bicycle, but was sent home, as he did not look well. His sight was becoming dim, and when first seen on the 10th he could only count fingers with the right eye and could see nothing with the left. The pupils were widely dilated and the fundus appeared normal in both. He stated that for a day or two he had lost all sense of taste, but that had returned. On February 17th, he could not even count fingers; there was numbness of the right leg, arm, and side. Paresis of the left internal rectus then appeared and a divergent squint developed; the lids remained half closed. On February 21st his gait was staggering. For some weeks his vision remained the same, but his general symptoms became more marked, and he was sick every time he tried to rise.

On March 22d, his vision had decidedly improved, and he could count fingers with both eyes; the sickness had disappeared and his strength was returning. His memory was very defective, and he could remember nothing of the first few weeks of his illness.

On May 5th he could walk fairly well and the vision was steadily improving. On June 8th he saw Dr. Shaw again; he was quite well and strong, except for his sight, which had, however, improved to R V $\frac{1}{24}$ and L V $\frac{1}{6}$. The fundus remained quite normal.

THURSDAY, JULY 27, 1905. DR. G. A. BERRY, PRESIDENT, IN
THE CHAIR.

The discussion on **intraocular tuberculosis** was opened by Mr. W. H. H. JESSOP, who limited himself to dealing with the disease as it affected the choroid, iris, ciliary body, and retina, and as the chief seat of lesion was the choroid, he dealt at length

with the two principal forms in which it was met—viz., miliary tubercle and solitary choroidal tubercle; of the latter an analytical table of twenty cases, collected from various authors, was given.

Solitary tubercle was, he said, generally found as a rounded spherical body of a gray, white, or yellow color, starting beneath the retina from near the optic disk, but it seldom tended to infiltrate the retina. The surface was nodular, and the whole mass sometimes flecked round with spots like diabetic retinitis, but not pigmented. Yellowish, caseating spots were sometimes seen on the surface. Hemorrhages might occur, but they were not often recorded.

In miliary tubercle of the choroid, tuberculous meningitis was nearly always present; out of fifteen cases at St. Bartholomew's Hospital, fourteen had it, while the other had general tuberculosis.

Tubercle of the iris and ciliary body were next treated, and also that rare condition, tubercle of the retina.

As to diagnosis, the best test was inoculation experiments. In many cases, especially if caseation had taken place, the bacilli were not to be found; the other signs, such as giant cells, etc., were of very minor importance.

He had never seen a case of primary intraocular tuberculosis, and he doubted much if such ever occurred. In acute miliary tuberculosis, choroiditis was found to be present in about 50 % of the post-mortem cases and about 30 to 35 % ophthalmoscopically during life. He had not had much experience with tuberculin, but he felt sure that the old tuberculin was not trustworthy and it often did much harm. The excellent results of von Hippel when using tuberculin T R led him to think it should be tried in every doubtful case for diagnostic purposes, and on all the cases as a means of treatment. The largest dose to begin with should not exceed $\frac{1}{100}$ mg, which could be increased gradually to 1 mg.

He much deprecated excision of tuberculous eyes unless there was great pain and the general health was much affected thereby. As the condition was not primary, the disease could not by this means be removed, and there was real danger of setting up meningitis, as shown by the fact that out of eleven cases that were excised eight died within two months from this disease, which was a great contrast to Schieck's thirteen cases treated with tuberculin all of which recovered and not a single eye was lost.

In miliary tubercle of the choroid he had never seen vitreous opacities, neither were they present in his two cases of chronic choroidal tubercle which were cured after the latter condition was cured. The most remarkable thing was the small apparent change in the part of the fundus where the tubercle existed, and also the absence of pathological pigmentation even in the neighborhood of the greatest lesion.

In the cases of pulmonary phthisis at St. Bartholomew's Hospital he found no note of choroidal changes, but Carpenter and Stephenson found 11 cases out of 119 in children, or 9.24 %.

In his two cases in which tubercle was demonstrated, or inoculation experiments succeeded, and thus made the diagnosis sure, he found after the lapse of four and five years that the changes were not visible in the macular region but started near the disk, as did also most of the twenty cases detailed. The absence of much scarring, and the total absence of pigmentation seemed to distinguish the cases from those of syphilitic type.

Professor HESS said he had made tuberculin injections in 26 cases, in 18 he used the old tuberculin, and in 8 the tuberculin T R. In 50 % of the cases (9 of the old and 4 of the T R), general reaction followed; in 2 only, where there was iritis, local reaction was noted, and in these cases of iritis general reaction followed in even more than 50 % of the cases. Besides these, general reaction was found once in a case of recent choroiditis and once in a case of interstitial keratitis. He thought that local reaction only should be considered as proof positive of the tuberculous nature of the iritis or keratitis, but as we so often found general reaction in cases of iritis which clinically show the same signs as those which give rise to local reaction, it seemed to him probable that a great many cases of iritis were caused by tubercle. As to the therapeutic effect, he had not sufficient experience to say much except that he had never observed any ill effects from the injection, and in one case of iritis with strong local reaction a very evident improvement in the condition was observed.

Dr. JOHN HERN (Darlington) said he had had many cases treated with the new tuberculin used according to Koch's directions. In at least 85 % there was general reaction, and in about 50 % there was some local reaction. As a means of diagnosis it was very useful, but he considered it quite useless for treatment, or even harmful, for some cases appeared to get worse as the result of the increased inflammatory changes set up in the eye.

Dr. CECIL SHAW (Belfast) had seen a case of apparently primary tubercle in a boy aged nine. A small tumor appeared on the inner side of the left eye, and as it increased rapidly the eye was enucleated. Previous to this some retinitis was seen in the right eye, and a few weeks later signs of meningitis appeared, but these passed off. During the next two years the patient suffered from tuberculous abscesses and bone disease on the left arm, leg, and side. Under general treatment the health was slowly restored, and except for lameness the patient recovered. The enucleated eye showed a typical tuberculous growth.

Mr. W. M. BEAUMONT (Bath) related the following case. A girl, aged ten, was seen by him at the Bath Eye Infirmary in September, 1900, with a phlyctenule at the outer margin of the left cornea which had been seen for fourteen days. In spite of treatment it remained in a chronic condition until the following February, when it healed. In July it broke down, but in three months it healed. For more than two years it gave no trouble, but in February, 1904, she returned in a similar condition. This time it healed quickly. In July, 1904, she was admitted with episcleritis of the same eye; this spread, but by September it had got well. In October she developed iritis in the same eye, and this was cured in a month, and the vision which was $\frac{6}{8}$ became reduced to $\frac{6}{12}$. A week after her discharge she returned with optic neuritis in the same eye, and this remained until January, 1905, when white spots showed themselves in the macular region. The urine was healthy, the sight remained at $\frac{6}{12}$, and the field was full. On February 16th the spots were more numerous, a month later the vision had improved to $\frac{6}{9}$, but two weeks afterwards the glands of left side of the neck became enlarged; they increased in size and number during the following four weeks. The child was ailing and low-spirited, with temperature 99.4° . On April 20th the retinal spots had disappeared, but one of the supraclavicular glands became enlarged and a week later it was increased and thick pus was evacuated containing numerous tubercle bacilli. During May a retinal hemorrhage occurred near the disk, and shortly afterwards she was seen by Dr. Freeland Fergus, who found chronic optic neuritis, but the hemorrhage had disappeared. Her general health began to improve and she became bright and lively, and now, two months later, she is in excellent health, the glands have subsided, she has no cough, and there are

no signs of tubercle. The right eye had been healthy throughout, with vision of $\frac{5}{8}$.

The point he raised was whether the tubercle bacilli obtained entrance through the phlyctenular ulcer, and if they did not what was the cause of the cycle of events; the iritis was not nodular and there was no tuberculous choroiditis. He himself believed with Eyre that a broken-down and ulcerated phlyctenule "makes an excellent nidus for the tubercle bacillus" and that this is the explanation of the case. The white spots in the retina have been noted by Story and O'Sullivan in a case of undoubted tuberculosis of the retina.

Mr. TATHAM THOMPSON (Cardiff) mentioned a case he had seen eight or nine years ago, in which he had excised an eye for the relief of severe pain, in which tuberculous choroiditis and iritis were diagnosed. Death from tuberculous meningitis occurred within three or four weeks.

Sir VICTOR HORSLEY rose to obtain the view of the Section on the practical point raised by Mr. Jessop, that in chronic tuberculosis choroidal changes did not occur which could be regarded as specifically characteristic. He further wished to learn in reference to the case quoted by Mr. Beaumont, whether the view which he understood had been advanced some years ago, that in acute cases of central tuberculous infection the changes in the fundus were specifically distinguishable from those set up by or accompanying other forms of intracranial disease, had been confirmed.

Remarks were made by Mr. LAWFORD and Mr. BISHOP HARMAN, after which Mr. JESSOP replied.

Dr. J. HERN (Darlington) made some observations on the effect of the presence of adenoids and other abnormalities in the naso-pharynx on some affections of the eye. Soon after Meyer of Copenhagen had drawn attention to the facial and other indications of adenoids, Dr. Hern noticed that they were especially present in cases of phlyctenular, eczematous, or scrofulous conjunctivitis, and, unless the naso-pharyngeal condition was treated, the eye symptoms frequently recurred, whereas if the adenoids were removed recurrence did not take place and the child lost all the facial peculiarities that had been so obvious. In all such cases, a careful examination should be made by a rhinologist, no matter whether the patient be a child or an adult, as both conditions are manifestations of the so-called strumous diathesis.

In his opinion, the eye condition was secondary to that of the naso-pharynx. The way in which this was brought about was by means of lowering the general health, and by the actual extension of the inflammatory process up the nasal duct, in much the same way as the Eustachian tube was affected by throat conditions and deafness was produced.

Dr. A. H. BENSON (Dublin) read a paper on **evolution in blepharoplasty**. He pointed out that in Ireland entropion and trichiasis were amongst the commonest of eye troubles following trachoma, and as they were the cause of so much misery and damage to sight it was of the highest importance to find out and adopt the best method for dealing with the condition.

Of the hundreds of operations proposed and practised, but few gave satisfactory results, and many of them were objectionable and injurious.

He then traced the various operations that had been employed from the earliest days for its relief, beginning at the old operation of cutting off the margin of the lid, hairs and all. The relief was of course immediate, but it caused so much shortening of the lid that the cornea was never again completely covered, dirt got in, and a condition of xerophthalmia resulted so that the last state of that eye was worse than the first. This had to be given up.

The next thing was that the cilia themselves only were excised. This was a great advance, but it likewise produced great shortening of the lids, and it also was abandoned.

Now every effort was made to retain the cilia, and numerous operations were devised to effect this end; they mostly had for their object the shortening of the skin to make it the same length on the outer side as on the inner. However two wrongs could not make a right, and these were all found to be wanting and were more or less abandoned.

They then split the lid horizontally, leaving the cilia in the anterior flap, removed a piece of skin, and stitched the flap containing the lashes away from the eyeball, but here again the design was faulty and they took away what should have been left.

The next stage marked an entirely new era. The piece of skin which had up to this time been removed was now transplanted into the raw surface beneath the cilia, and the lid was not short-

ened, and nothing was thrown away. Every one thought that perfection had been reached and the results were infinitely better, but still skin is not mucous membrane and did not act well as such, and the skin had hairs on it, which, although not coarse ones, did yet cause some irritation. Rabbits' conjunctiva was substituted, but with poor results, and finally the mucous membrane of the patient's own lip was transplanted, and this is the latest and by far the best method yet adopted. He described in detail what he termed the St. Mark's operation, for it was devised and the details were elaborated at that hospital, and he considered it the simplest and most satisfactory of all the operations. If the flap be carefully laid down on the place made for it, and there sutured, there was little or no risk of its sloughing. Care should be taken not to make the flap of mucous membrane too large, for it does not shrink like skin, and it should only just fit, or be a trifle smaller than the place it is intended to fill; slight stretching does no harm. It is also quite unnecessary to wait for the bleeding to stop before applying the flap; the bleeding does no harm if the flap is fixed. The operation is equally applicable to both upper and lower lids and to all varieties of entropion. This operation he stated had been performed for the last twenty-one years at St. Mark's Hospital, and yet but few seem to know much about it. When once the result had been obtained it was permanent, for the flap did not shrink, but remained without perceptible change for years.

Remarks were made by Professor HESS, Dr. HENRY, Mr. TATHAM THOMPSON, the PRESIDENT, Dr. CECIL SHAW, and Mr. LAWFORD.

Dr. BENSON in reply said that in his experience when a skin flap was transplanted it never ceased to cause irritation by reason of the hairs on it, and the disintegrated epithelium, which even after many years remained the same, and the only condition which might cause it to cease to be annoying is when partial sloughing of the surface of the flap took place. By modifications in detail it could be made suitable for all degrees of the affection.

The President (Dr. G. A. BERRY) read a paper on a **new test for visual acuteness**. He stated that there were two points which could hardly yet be said to be definitely settled. The one had reference to the scale according to which fractional amounts of the full normal standard should be estimated. The other

took into consideration the nature or configuration of the test objects which might be most suitably used when the scale had been decided upon. Although the usual method of representing vision according to the angle subtended by the test object was scientific and fairly accurate, yet it was far from representing in a satisfactory manner what he referred to as the scale of efficiency. In any scheme devised it was necessary that it should be correlated in some way to the ordinary scale of visual acuteness, and also it must admit of some degree of variability or elasticity so as to meet the requirements of varying conditions.

For ordinary purposes Snellen's types were the best we possessed, but there were certain defects which might be eliminated by another method more suitable for particular cases; these defects were mainly that all letters were not equally legible, and that when once read and recognized they were easier to read a second time, they were altogether unsuitable for children and illiterate people, and those devised for the latter class were not suitable for the former.

In order to obviate these disadvantages he had devised a method of using a number of alternating black and white squares of the same size as the spaces left in Snellen's letters but covering a considerable area, and the way in which these were seen depended upon the distance they were from the eye. The size of the squares he used were 1, 2, 3, 6, and 12mm, subtending angles of 1, 2, 4, 8 at 5 metres. At and beyond some particular distance, according to the acuteness of sight, these surfaces no longer appeared checked, but either ran into lines or looked uniformly gray; the appearance of lines was due to astigmatism, which lines run parallel with the diagonals of the squares. The most convenient way was to mount several circular patches made up of squares of different sizes on a disk, as well as other gray circular patches which could be used for controlling the patient's statements. A test like this would no doubt be useful for anthropological researches, for an intelligent savage with a piece of paper printed with squares in one hand and another piece gray in the other, could readily indicate whether the disk pointed to resembled one or other piece of paper he was holding; children also could do this if unable to read. In addition it showed at once slight degrees of astigmatism.

REPORT OF THE THIRTY-SECOND MEETING
OF THE GERMAN OPHTHALMOLOGICAL SOCIETY AT HEIDELBERG AUGUST 3 TO 5,
1905.

REPORTED BY DR. TREUTLER, DRESDEN.

Translated by Dr. MATTHIAS LANCKTON FOSTER.

(Continued from vol. xxxiv., page 671.)

DEMONSTRATION SESSION, AUGUST 4TH, 3 P.M., DR. ROGMAN
PRESIDING.

A few demonstrations illustrative of the papers which had been read were made.

4. CZERMAK exhibited a **small blind eye in which the lens was replaced by a fibrous, vascularized pseudolens**. The pupil was secluded, and there was a glaucomatous excavation of the optic nerve. He sought to demonstrate anatomically that the lenticular condition was congenital. Grothad described a similar case as cataracta congenita vasculosa.

5. K. RAEHLMANN. **Amyloid degeneration of the lids and conjunctiva**. Like glycogen, which as an intermediate stage between albumin and sugar is a normal constituent of the body, amyloid belongs physiologically with the albumenoids, but chemically with the carbohydrates. Amyloid degeneration is frequently associated with colloid and with mucous transformation. To demonstrate such degeneration histologically, a double staining with eosin hæmatoxylin is recommended in addition to the reaction of iodosulphuric acid, methylviolet, etc. The histological process through which all these transformations of the albumin of the normal tissue pass into allotropic forms, takes

place exclusively under the influence of the presence of ferments, *i.e.*, other forms of albumin foreign to the tissue. According to Redner's ultramicroscopic researches regarding the solution of albumin and its transport in the body, these ferments are not dissolved, but are held in suspension in the tissue fluids. Through the union of these ferments with the local albumin, or with the products of its destruction, new allotropic albumenoids are formed which have a different molecular composition and chemical reaction. Under the ultramicroscope, the change of the tissue albumin into albumose or pepton, as well as the process of the change of glycogen into sugar, can be observed. The substratum of glycogen, which is nearly related to amyloid, is formed of little, plainly visible, spherical, gray bodies, which, after the addition of the diastase, diminish in size, become broken up into minute particles, and gradually disappear under the eye of the observer. As long as the solution contains these spherical bodies its chemical reaction is that of glycogen, but after these spherical bodies have been destroyed and have disappeared it is that of sugar. It may be *a priori* conjectured that similar changes take place in amyloid, and it must then be assumed that the cause of the transformation of the local tissue albumin into amyloid is the introduction of a molecule of albumin which acts as a ferment. This theory is supported by a series of microscopical conditions. In the first place, at the beginning of amyloid degeneration, even before the appearance of the characteristic reaction, fine, dust-like granules may be seen in the affected tissue. When the degeneration in the cellular tissue of the conjunctiva begins just beneath the epithelium, the cells can sometimes be seen to be filled with granules, which must be looked upon as a transformation of the cell albumin, but partly also as constituents which have entered and promote the transformation of the albumin. This is supported by the fact that in the commencing formation of lamellæ about the foci of amyloid numerous little globules, scarcely visible with the ordinary microscope, are found between the cells.

These granules are very frequently found within the nuclei of the affected cells, sometimes confined to them, and then the nuclei are filled with larger and smaller globules, as in karyokinesis.

That these granules introduce the commencement of the formation of amyloid may be proved by the chemical reaction. In

some of the specimens exhibited there were within the cells only occasional globules stained blue, in others single granules within the nuclei had undergone amyloid degeneration. Hence the nucleo-albumin of the cell nucleus may alone degenerate, or the albumin of the cell protoplasm, or the albumenoid of the connective substance degenerate as well. Whether the degeneration affects the one or the other albumenoid evidently depends on the chemical or physical affinity of the latter to the ferment.

A granular change in the cells is also to be observed in hyaline and colloid degeneration, very similar to that produced by the presence of glycogen in cellular tissue.

Traina and Ziegler have recently described almost exactly similar granules as regularly present in the glandular cells of different organs, and have demonstrated them to be particles of fat.

The single cells come to degeneration by confluence of the degenerated little corpuscles, and the formation of layers results from the confluence of the cells, but the contents of an apparently homogeneous cell or layer is still in truth granular, as is shown by the ultramicroscope.

As clinical experience teaches that amyloid developed locally on the eye may undergo complete retrogression with return to the original tissue, there remains necessary for the explanation of this process only the theory that during the condition of degeneration the original unity of tissue is preserved, at least chemically. The change of the amyloid into the original tissue albumin may then follow the scheme of removal which has been observed ultramicroscopically in the isomeric glycogen.

6. FLEISCHER (Tübingen). **Family degeneration of the cornea.** After a review of fifty-nine cases hitherto described, including both the macular and lattice-like opacities of the cornea, Fleischer reported twenty-four cases which had been observed in the clinic at Tübingen. He showed that most of these cases came from within a certain district in Swabia, but had not discovered the cause why it infested this region. Consanguinity did not appear to be present, but the author was inclined to believe that it existed. All the cases were of the macular form. In many cases the periphery was the part less affected, but it was never uninvolved. The deposits lie in the different layers of the cornea, and trouble is caused only by those situated superficially.

The disease usually begins in the first decade of life. Six cases were exhibited which differed from the hitherto described form in that the changes were ring-shaped, and this new variety of the disease was denominated annular. The author considers the disease degenerative, and cannot convince himself that it is of tuberculous nature.

Discussion.

GOLDZIEHER had seen a similar case, in which the epithelial cells were much enlarged.

DEUTSCHMANN referred to his own former publication on unfamiliar corneal diseases.

7. VON REUSS exhibited preparations of the **posterior capsule of the lens with an abscess of the vitreous**, which had resulted from a double perforating injury with a sliver of iron. The course of the iron was such that a direct injury of the capsule could be perfectly excluded. The conclusion of the writer, based on the microscopical condition and the writings of others, was that the perforation of the posterior capsule was due to the action of the pus and bacteria coming from the ciliary body or vitreous.

8. HALBEN. **Differential refractometer.** The best researches hitherto have given only an imperfect picture of the optic stratification of the lens. The anatomical deductions from fresh lens masses of prescribed form, size, and position are inexact and uncertain. Then there are changes of index from loss of water. As the masses crushed between the prisms of Abbe's refractometer are not optically homogeneous, the border line of total reflection appears indistinct and the index not exactly determinable. The formation of an indicial curve from these few uncertainly measured index values of uncertainly prepared masses of lens is crude. Since I demonstrated refractometrically for pseudo-cataracts and black cataracts that undue increase of the index of the lens can easily produce serious disturbances of vision like those induced by cataract, I have undertaken the construction of an instrument with which the refractive index of the smallest portion desired of an uninjured fresh section of the lens in situ could be determined. The tube of an Abbe's refractometer over the ocular is prolonged, and in this, by means of a freely movable perforated shutter within a right-angled co-ordinate system, the smallest diameter desired can be isolated in

sectional zones following each other at a distance of $\frac{1}{2}$ mm in the suspended inverted picture of the section without moving the object itself. The indices of all these points are easily read and are used as ordinates in the sketch of the indicial curve. As a control observation, the sites of the highest and lowest indices are sought out by means of the shutter, together with as many intermediate isoindicial zones as may be desired. In this way is obtained a diagram of the optic density of the lens from its centre to its periphery, which shows a surprisingly great total amplitude between the highest and the lowest index, and almost always greater decrease of index in places on the anterior and posterior margins of the nucleus. These observations deprive Mathiessen's teachings of their value and render necessary a revision of the teaching regarding the total index.

THIRD SESSION, AUGUST 5TH, 9 A.M., DR. SCHLEICH PRESIDING.

17. ZUR NEDDEN (Bonn). **The removal of deposits of chalk and of lead from the cornea.** Chalky deposits in the cornea contain no albuminate of calcium, because calcium and albumin have very slight chemical affinity for each other, but contain calcium carbonate, while, on the contrary, the deposits of lead contain at first not the carbonate but the albuminate, because lead and albuminate have a great affinity for each other. Still the albuminate of lead becomes gradually transformed through the action of CO into the carbonate. Therefore any chemical means employed to remove lead and chalky deposits must be able to dissolve both the albuminates and the carbonates. Several neutral ammonium salts fulfil this condition, and are equally good for the removal of chalk, while ammonium tartaricum is the best for the removal of lead. The removal of incrustations of lead from the eyes of living rabbits by means of tartrate of ammonium was successful only when the incrustations were fresh and contained little carbonate. With chalky deposits, on the contrary, improvement could be obtained on the living eye, even after the lapse of years, through the use of ammonium salts, of which tartrate of ammonium had proved the best. In seven cases of incrustation of chalk on the human eye a noticeable improvement was twice obtained by the application of ammonium chloride, as recommended by Guillery. In a case of lead incrustation, treated three times a day for three quarters of an hour each time

with ammonium tartrate, the very thick opacity of the cornea passed nearly away in the course of seven weeks, and the vision became greatly improved.

18. H. E. PAGENSTECHER (Heidelberg). **Corneal opacities due to the action of quicklime.** The author sought to demonstrate analytically that the primary opacities of the cornea cannot be explained by the action of solutions of calcium salts, either as a deposit of carbonate of lime or of phosphate of lime, or by the deposit of a calcium albuminate insoluble in water in the corneal tissue. He thinks that the porcelain-like opacities caused by the presence of lime in the corneal tissue are due to the union of the lime with the collagenous substance.

19. TH. LEBER (Heidelberg). **The metabolism of the crystalline lens.** As the result of his experiments, Leber has come to the conclusion that the molecular constitution of the substance taken up and the selective power of the lens determine the degree and duration of the process. One of the most important parts of this selective action seems to be the affinity of the lens for soluble lipoid substances, the admission of which in the serum is perhaps favored by the increase of lecithin and cholestearin in the lens.

20. HESS and ROEMER (Würzburg). **Elective functions of the pigment epithelium in the retina.** Römer and Hess have made use of the results of the serum investigation in the study of the functions of the pigment epithelium and of the retina. Römer spoke first of the relations of the pigment epithelium to constituents of the normal serums. The single question studied in 104 experiments with eight different kinds of normal serums was in what way the actions of the normal serums demonstrable in the test-tube are influenced by the pigment epithelium and retina of swine and cattle. These revealed curious elective functions, *e. g.* the hæmolysins of the normal serums. The individual hæmolysin of the normal dog serum is influenced very differently by the pigment epithelium. The lysis of the blood corpuscles of cattle is completely agglutinated, others are not influenced at all. In this way it can be determined whether certain pigment epithelium in a test-tube came from swine or cattle. These investigations give a very interesting insight into the elective functions of these structures, which renders possible a further advance in our knowledge of their physiology and pathology.

Hess reported a series of experiments from which it was learned that the introduction of perceptive retinal elements into the peritoneal cavities of guinea-pigs was productive of antibodies which were specifically injurious to the rods. The work preparatory to these experiments consisted of an investigation of the behavior of fresh rods in salt solutions of different strengths, which showed that in salt solutions of 0.4 % and less the fresh rods almost instantly rolled themselves together into spherical and annular structures, while in stronger solutions they maintained a form approaching the normal for a longer time. The temperature had an important influence on the signs of degeneration which could be observed in the latter case.

Discussion.

ROSENMACHER sought to know whether pus-exciting micro-organisms multiplying only in the uveal tract area so changed during life that they acquire specifically deleterious relations to the uveal tracts of the genus of animals affected. The cultures of staphylococcus bred by Professor Neisser in the ciliary bodies and pigment epithelium of rabbits died and these toxins were introduced into the circulation of rabbits. Both animals experimented on showed foci of infiltration and diffuse proliferation of pigment in each eye. If this condition is constant, the specific relation of certain organisms to the uveal tract will furnish the key to the explanation of the occurrence of sympathetic ophthalmia.

21. TH. LEBER (Heidelberg). **Filtration from the anterior chamber.** The author and Dr. Pilzecker have undertaken some new experiments with the filtration manometer in regard to the different influences which govern the normal filtration of the eye. They used a 1 % solution of chloride of sodium, which is identical with the aqueous and not markedly different in its viscosity. The temperature of the fluid was found to have great influence on the filtration. The warming causes the fluid to pass more readily from a decrease of its so-called viscosity. The quantity of fluid which enters an eye under a constant pressure depends not only on the degree of the pressure but also on the condition of tension present in the eye. This explains why in an enucleated eye, the tension of which has been brought again to normal, the entrance of fluid is at first rapid and then gradually decreases so that often

a long time intervenes before it becomes constant. These and similar observations permit the assumption that the fluid which entered the eye during the experiment does not always escape completely through filtration, but remains in part therein, and that by a gradual bending or stretching of the wall space is created. Experiments on the capsules of eyes which have been emptied and filled with mercury have confirmed this theory. Although a filtration outward of the contents was thus completely prevented, yet fluid entered the eye not only during the first minute, but also for a long time afterward, though in less and rapidly diminishing quantity, the pressure remaining constant. If in an experiment the entire amount of supplementary fluid which would enter the eye in an hour should be pressed in quickly, the pressure would require to be more than doubled. To confirm this result, the fluid which enters and the filtrate which exudes from the eye should be accurately measured, while the weight of the eye should be determined both before and after, as well as sometimes at regular intervals during the experiment. This shows that only a part of the fluid which enters the eye in the course of one or two hours, at most something over a half, sometimes only one-third or one-quarter, escapes through filtration, and that the remainder remains in the eye. The diminution of the fluid entering which occurs during the experiment is because the increase in volume which is considerable at first becomes gradually less and finally disappears. The filtration, on the contrary, gradually increases during the experiment.

In order to obtain as accurate a measure of the filtration as possible, the relaxation of the eyeball which follows the death of the animal must be avoided. This is accomplished in rabbits by the introduction at the moment of death of sufficient fluid into the eye to maintain its tension at its former height, and at the same time the cooling of the eye is prevented.

The most noteworthy result thus far obtained is that there is no such fixed relation between the tension and the fulness of the eye as has hitherto been represented. The peculiar elasticity of its walls permits the eye to accommodate itself to great changes in the size of its contents without producing any marked change in its tension. Herein lies a protection against the action of causes which tend to increase the tension. As this protection must diminish as the rigidity of the sclera increases, a better explanation

is furnished of the greater predisposition of age to glaucoma than we have hitherto had.

22. RÖMER (Würzburg). **The aggressines of pneumococci in the pathology of ulcus serpens.** Römer reported further progress both as regards the pathology of ulcus serpens and as regards the serum therapy. Two points have hitherto been unsatisfactory: the lack of a valuation of the serum, and the uncertainty whether the different stocks of pneumococci taken from these ulcers differed so much from each other biologically as to limit the value of the serum. The author claims that it is quite possible to determine the protective value of the serum, although on account of the lack of any control it has been doubtful whether the individual serum tests have always contained a satisfactory protective value, and that this evil may be corrected by placing the proving of the serum in the hands of the State. The aggressines of the pneumococci are of the greatest importance in the development of ulcus serpens. These substances, which may be obtained for the purpose of study from inflammatory exudates, enable the pneumococci to develop in tissue, and the malignity of an ulcus serpens is directly proportional to the ability of the pneumococci to supply these substances in large quantities in the animal organism. All stocks of pneumococci taken from ulcera serpentina produce these specific substances. The proof of this is that an animal may be rendered immune against a very virulent stock of pneumococci by the aggressines of various other stocks. This proves the biological homogeneity of the different stocks of pneumococci and also opens a wider perspective for serum therapy.

Discussion.

MAYWEG reported eighteen cases of ulcus serpens which he had treated with Römer's serum. He advocated the method, which had given particularly good results in the early stages of corneal disease.

SATTLER had treated two mild and ten severe cases of ulcus serpens with dead cultures of pneumococci according to Römer's method. The former recovered, but of the latter four improved temporarily while six were not affected.

23. H. ULBRICH (Prague). **Tetanus infection of the eye.** Some cases of tetanus have been reported which were compli-

cated by injuries of the eye, but in the majority the injury of the eye could not be considered of etiological importance. Hitherto there has been nothing published regarding the behavior of the tetanus bacillus in the eye. In the eyes of rabbits the tetanus bacillus behaves the same as in the bodies of rabbits—*i. e.*, when injected in pure culture it does not develop well and the animals do not get tetanus. On the contrary, the local signs of inflammation which follow any intraocular injection of bacteria accompanies the infection of the eye with tetanus. Eight days after the infection of the anterior chamber the tetanus germs are still present in the aqueous, and after five weeks they may still be obtained by culture from the iris. It is almost hopeless to search for the tetanus bacillus in the eye by means of the microscope alone; it can only be demonstrated by means of cultures.

Discussion.

WAGENMANN reported a case of tetanus after a stab wound of the orbit.

24. DA GAMA PINTO (Lisbon). **Plastic surgery of the lid.** Ectropion caused by malignant pustule is common in Portugal. To replace the lid, da Gama Pinto uses a non-pedicled flap of the skin. The use of pedicled flaps takes too much time and is too disfiguring. Thiersch grafts wither quickly and are disappointing. He takes the flap from the inner side of the upper arm or of the thigh, or better yet from the prepuce, the sole disadvantage of which is its somewhat dark color which tends to become still darker. The point of chief importance about the operation is that everything connected with it, hands, instruments, field of operation, sponges, bandages, all must be absolutely dry. This favors the quick union of the flap and insures a good result. Thirteen successful cases out of a total of fourteen operations. Foreskin used three times.

Discussion.

BIRCH-HIRSCHFELD recommended Budinger's tarsoplasty operation, flap taken from the cartilage of the ear, to restore total loss of the lid.

TRANSACTIONS OF THE TWENTY-SECOND ANNUAL MEETING OF THE FRENCH OPHTHALMOLOGICAL SOCIETY, MAY 1-4, 1905.

REPORTED BY DR. E. BERGER, PARIS.

Translated from the *Arch. f. Augenhk.*, Vol. LII., Sept., 1905, by Dr. MATTHIAS LANCKTON FOSTER.

BOURGEOIS (Rheims). **Report regarding the full correction of myopia.** Most ophthalmologists consider that the great effort at convergence is the chief factor in the origin and increase of myopia. Full correction has a favorable influence on myopia and retards its increase. It is still a question whether the full correction is advantageous in malignant myopia. Even a myopia of very low degree should be corrected in children in order to prevent its increase. For young people the full correction of myopia of low or medium degree may be prescribed at once, but it is better to partially correct the higher degrees and gradually increase the strength of the glasses until the full correction is worn. For myopia over twelve dioptries no general rule can be formulated. Even slight degrees of astigmatism should be corrected at the same time. In anisometropia the subjective tolerance of the patient must determine whether the full correction should be prescribed or not. Decentred lenses should be used only in concomitant insufficiency of convergence. During school life the glasses should be large, periscopic, and either round or slightly elliptical. In progressive myopia the general condition of the child should be carefully inquired into.

BOURDEAUX, B. **Convergence in corrected myopia.** By means of Remy's diploscope it is shown that most myopes have not normal binocular vision when their refractive errors are fully corrected, and that they converge strongly. They have to

converge strongly to obtain binocular vision for distance, and this convergence is increased when the myopia is fully corrected. Bourdeaux thinks that the dizziness, diplopia, and headache which have been observed many times after full correction of myopia depend on this strong convergence.

TSCHERNING (Paris). **Orthoscopic lenses.** Marked spherical aberration and astigmatism are produced by moving a bi-convex or a bi-concave lens so that the visual line passes through its peripheral portion, and bi-convex lenses narrow the visual field. Hence such lenses should not be used either in the trial case by the physician, nor worn by patients. To avoid these faults, Tscherning has prepared a test case of periscopic and plano-spherical lenses, the latter for use when a sphero-cylindric combination is desired. The plano-spherical lenses may be prescribed for ± 3 dioptres or less instead of the periscopic.

ANTONELLI (Paris) prefers the plano-spherical to the periscopic lens because the latter are too heavy and too expensive. In combining sphericals with cylindricals, if a convex cylinder is ground on the anterior surface of a concave lens, and a concave cylinder on the posterior surface of a convex lens, the distance of the cylindrical surface from the eye may always be calculated. In high myopia, plano-concave lenses give much better results than periscopic.

JAVAL (Paris). **Writing and myopia.** Javal recommends as a preventive of myopia that vertical writing should be taught in the schools.

SULZER (Paris). **The origin of the prejudice against glasses.** From the fifteenth to the middle of the nineteenth century glasses were fitted only by the dealers. The Faculty of Medicine at Paris excluded all who were engaged in prescribing glasses. Only a few scholars had access to the works of Roger Bacon, Descartes, Kepler, and Lahire on the subject. Up to the middle of the last century ophthalmologists opposed the wearing of glasses and were accustomed to ascribe almost every disease of the eye to their previous use.

TRUC (Montpellier). **Inspection of the eyes of school children in Montpellier.** The light was found to be faulty during the day in many schools, but good at night in most of them. The seats and desks were criticised. 6445 school children were examined. Myopia was present in from 8 to 12 per cent.

VALUDE (Paris). **Ophthalmia nodosa.** Valude observed a case of this disease which was caused by a caterpillar thrown against the cornea. A large number of little gray, superficial nodules were found on the cornea. Recovery was rapid under a moist dressing.

ROLLET and AURAND (Lyons). **Experimental keratitis aspergillosa.** The *aspergillus fumigatus* produces experimentally the most intense changes in the cornea. The other forms of *aspergillus* have a less deleterious action.

DESCHAMPS (Grenoble). **The influence of subconjunctival injections on the curvature of the cornea and on astigmatism.** Deschamps claims that corneal astigmatism may be influenced by subconjunctival injections, and recommends their use for this purpose. The injections should be made as close as possible to the margin of the cornea.

DEMETS (Antwerp). **Ill-timed methods of treatment.** Demets believes that too many and too energetic medicaments are used in ophthalmology, and would substitute the use of protargol for that of silver nitrate.

ARMAGNAC, LAGRANGE, and WICHERKIEWICZ consider that the use of silver nitrate is indispensable in ophthalmology, but that one should know how to use it rightly.

DARIER (Paris). **The use of radium in medicine.** Radium is analgesic, alleviates convulsions and spasms, and stimulates the motor and sensory nerves. It is therapeutically indicated in superficial epitheliomata, trachoma, episcleritis, vernal catarrh, and intraocular hemorrhages.

WICHERKIEWICZ and VALUDE have seen no result from the use of radium in epithelioma of the lid, but have observed the disappearance of papilloma of the conjunctiva after the application of radium rays.

DUBARRY and GUILLOT (Havre). **Treatment of choked disk by trephining.** After lumbar puncture has failed, the skull may be trephined and the dura incised. Puncture and drainage of the ventricle are objectionable.

LAGRANGE (Bordeaux). **Improvement of the prothesis by transplantation of a rabbit's eye.** According to the method recommended by Chibret, the eye of a rabbit was transplanted into Tenon's capsule, with its cornea directed backward. The

ocular muscles were then united over it, and then the conjunctival wound was closed.

ROHMER, MOTAIS, VALUDE, and ARMAGNAC spoke in opposition to this method, because it does not furnish a movable stump, and therefore does not increase the mobility of the artificial eye.

CHEVALLEREAU (Paris). **Combined transverse keratotomy.** In order to obtain a good stump for an artificial eye, in many cases of corneal staphyloma the cornea may be split transversely, the iris and lens removed, and then a pressure bandage applied.

TEILLAIS (Nantes). **A new ocular symptom in Basedow's disease.** A dark discoloration of the lids, which appears simultaneously with the other symptoms of the disease. The writer observed this symptom at the same time as Jellinek and Rosin, but the latter secured earlier publication.

CHAILLONS (Paris). **Differential diagnosis between Parinaud's infectious conjunctivitis of animal origin and tuberculosis of the conjunctiva.** The clinical symptoms of these two diseases of the conjunctiva are so alike in many cases that they can be differentiated only by the microscopical examination. Giant cells are never found in the nodules of Parinaud's conjunctivitis, while they are almost always present in conjunctival tuberculosis. The diagnosis may also be made by experimental inoculation of the lower animals, because in them the tuberculosis is easily recognized.

TERSON, A. (Paris). **Gumma of the cornea.** A woman, twenty-two years old, who had hereditary syphilis, suffered first from parenchymatous keratitis. Four years later she had a severe iritis and a yellowish prominence to the temporal side of the centre of the cornea, which Terson diagnosed as a gumma. It became absorbed without ulceration after four injections of calomel. In late hereditary syphilis, gummatous nodules have hitherto been observed only in the lids, conjunctiva, lachrymal apparatus, and ciliary body.

AUBINEAU (Brest). **The difficulty in the diagnosis of the syphilitic origin of an iritis.** When a syphilitic iritis is not associated with the formation of papules or condylomata its syphilitic nature can be drawn only from the history. The author believes there are mixed forms, in which accompanying secondary

infection contributes to the production of an iritis and influences the clinical symptoms.

ROLLET (Lyons). **Tarsitis tuberculosa.** Tuberculous tarsitis may present the clinical symptoms of a chalazion, or may appear as an indolent swelling of the whole of the tarsus, which may be associated with tuberculosis of the skin and swelling of the glands. It causes a slight ptosis and a chronic hyperplasia of the lid. There is some clinical resemblance to syphilitic tarsitis. Treatment consists in curettage, deep incisions, and the actual cautery.

VILLARD (Montpellier). **Acute glaucoma caused by contusion of the globe (traumatic glaucoma).** Villard adds three new cases of traumatic glaucoma to the twenty-one already known. One case recovered completely, in the other two there was complete, or almost complete, loss of sight. He recommends treatment first with myotics and quinine, then paracentesis or anterior sclerotomy, and in case all these fail, iridectomy.

MOISSONIER (Tours). **Primary tuberculosis of the conjunctiva.** Moissonier observed a case in which there were reddish granulations and a large oval ulceration of the conjunctiva. Treatment effected a cure of the conjunctival affection but the tarsus became involved.

DUPUY-DUTEMPS (Paris). **Recurrence of an epithelioma of the lachrymal gland.** The lachrymal gland was extirpated on account of an epithelioma. Sixteen months later there was a recurrence, on account of which the orbit was eviscerated. The histological condition was that of an epithelioma with carcinoma in places.

FROMAGET (Bordeaux). **Radical operation for dacryocystitis.** Fromaget unites three different operations to secure the complete healing of a chronic dacryocystitis, extirpation of the lachrymal sac, curettage of the lachrymo-nasal canal, and removal of the lachrymal gland.

GOURFEIN (Geneva). **Diagnosis of tuberculosis of the iris by means of puncture of the anterior chamber.** In cases of tuberculosis of the iris the diagnosis may be confirmed by inoculation of animals with aqueous obtained from the anterior chamber.

ROHMER (Nancy). **Meningocele of the orbit.** A symmetrical tumor, occupying the nasal side of the orbits, was observed in

an eight-month-old child. The right tumor was removed without accident, and the pathological examination showed it to be a meningocele. Removal of the left tumor was followed by meningitis.

COSSE (Tours). **Melanosarcoma of the choroid and the manner of its extension to the orbit.** In Cosse's case a sarcoma of the choroid spread first to the iris and thence by way of Schlemm's canal to the sclera, the conjunctiva, and finally to the orbit. In the posterior segment of the globe the sclera and optic nerve were not involved by the tumor.

CONDON (Lorient). **A case of primary lymphosarcoma of the orbital lachrymal gland.** By means of Kroenlein's operation, an orbital tumor was removed from a man eighteen years old, which projected beyond the upper internal margin of the orbit. Microscopical examination showed that it was a lymphosarcoma, which sprang from the capsule of the lachrymal gland. The tumor recurred a few months after the operation.

TERRIEN (Paris). **A bright plate for the investigation of the visual field.** A demonstration of a bright plate which serves for the determination of central and peripheral vision and the fields for colors.

ANTONELLI (Paris). **Orbital abscess and purulent inflammation of the lachrymal gland due to an otitis media following grippe.** In a girl eleven years old, an attack of influenza was followed by a purulent otitis media, which resulted in an orbital abscess and a purulent dacryo-adenitis. Antonelli ascribes it to a direct passage of the pus from the tympanic cavity by way of the Gasserian fissure and the petro-tympanic suture to the pterygo-maxillary fossa, and thence through the sphenomaxillary fissure along the outer wall of the orbit to the lachrymal gland.

PECHIN (Paris). **A conjunctival inflammation of the newborn of lachrymal origin.** There is met with in new-born infants a conjunctivitis with muco-purulent secretion which is not improved by lavage or astringent collyria, because it is caused by an obstruction of the lachrymal passage, and therefore can be cured only by opening the passage either by injection or the passage of a catheter.

GALEZOWSKI, JEAN (Paris). **The evolution of amaurosis in tabes.** Amaurosis usually appears after some months, more

rarely after some years. Total blindness comes on slowly, because the two eyes do not become subject to atrophy simultaneously, as a rule. Out of ten cases of absolute bilateral amaurosis, the blindness came on in only one after six years; the course was usually more rapid—four years, three years, or only a few months.

COLOMB (Geneva). **Congenital dermoid tumors of the ocular conjunctiva and of the cornea.** Colomb has observed three cases in which the dermoid character was demonstrated. They were associated with other congenital malformations.

DUPUY-DUTEMPS. **A peculiar atrophy of the iris due to tabes and progressive paralysis ; its relations to the irregular form and the anomalies of the reflex movements of the pupil.** Dupuy-Dutemps has observed in tabes and in progressive paralysis a partial atrophy which affects only sectors of the iris. The pupil is broadest at the place where the iris is atrophic. This explains the irregular form of the pupil in progressive paralysis and its elliptical form in tabes.

The absence of the light reflex of the pupil is also a symptom of the atrophy of the iris. When the reflex of the pupil to accommodation, or when Galassi-Piltz's reflex is absent, the presence of atrophy of the iris can always be demonstrated.

This atrophy of the iris is never the result of iridoplegia whether of nuclear or of basilar origin. It occurs rather in consequence of a lesion of the peripheral neurones of the ciliary nerves, the twigs of which innervate the sectors of the iris, so that in this way the sector-shaped form of the atrophy is also explained.

CAPMAS (Orleans). **Non-magnetic foreign bodies in the posterior segment of the eyeball.** The position of a bit of stone in the posterior part of the eye was determined by means of the X-rays, and it was then extracted successfully.

DESVAUX (Angers). **Two cases of spontaneous hemorrhage into the vitreous.** Without known cause hemorrhages took place into the vitreous of a young person twenty years of age, and into that of an old man. In spite of the general treatment which seemed to be indicated, blindness resulted in each of the affected eyes.

SYSTEMATIC REPORT ON THE PROGRESS OF
OPHTHALMOLOGY IN THE FOURTH QUAR-
TER OF THE YEAR 1904.

By Dr. G. ABELSDORFF, in Berlin ; Prof. ST. BERNHEIMER, in Innsbruck ; Dr. O. BRECHT, Prof. R. GREEFF, Prof. C. HORSTMANN, and Dr. R. SCHWEIGGER, in Berlin ; with the Assistance of Prof. A. ALLING, New Haven ; Prof. E. BERGER, Paris ; Prof. CIRINCIONE, Genoa ; Dr. DALÉN, Stockholm ; Prof. HIRSCHMANN, Charcow ; Dr. J. JITTA, Amsterdam ; Mr. C. DEVEREUX MARSHALL, London ; Dr. H. MEYER, Brandenburg ; Dr. P. VON MITTELSTÄDT, Metz ; Dr. H. SCHULZ, Berlin ; Prof. DA GAMA PINTO, Lisbon ; and Others.

Translated by Dr. PERCY FRIDENBERG, New York.

Sections VIII.—XII. Reviewed by Dr. R. SCHWEIGGER,
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VIII.—LIDS.

624. GALLENGA, C. **Unusual frequency of palpebral phlegmon in the summer of 1904.** *La clinica oculistica*, Oct., 1904.

625. ERDMANN, P. **A case of marginal chalazion.** *Arch. f. Augenheilk.*, li., 2, p. 171.

626. YAMAGUCHI, H. **Syphilitic tarsitis simulating amyloid degeneration.** *Arch. f. Augenheilk.* li., 1, p. 8.

627. LAGLEYZE. **Operative treatment of entropion and trichiasis.** *Arch. d'opht.*, xxiv., No. 12, p. 773.

628. SOMMER, G. **Primary melanosarcoma of the eyelids.** *Wochenschr. f. Therap. u. Hyg. d. Auges*, No. 52, 1904.

629. HANKE, V. **Plexiform neuroma of the lid.** *v. Graefe's Arch. f. Ophthalm.*, lix., 2, p. 315.

GALLENGA (624, frequency of palpebral phlegmon in summer, 1904) saw, in the months of July and August alone, twelve cases of phlegmonous abscess of the lids, all in boys of the poorer class from five to ten years of age. Bacteriologic examination showed staphylococci in ten, streptococci in two cases. The

abscesses are due to infective skin diseases, which are frequent during the heated term, and caused by high temperatures combined with neglect of personal cleanliness. CIRINCIONE.

ERDMANN (625, **marginal chalazion**) saw in a patient with eczema and ectropion of the lower lids, a number of small nodules, one to two *mm* in diameter, on the margin of the upper lid, and corresponding to the absent openings of Meibomian glands. They were found, microscopically, to be composed of granulation tissue of degenerated follicles, *i.e.* chalazia. The latter are not to be looked upon as sebaceous cysts but as analogous with the pustules of acne vulgaris hypertrophica.

YAMAGUCHI (626, **syphilitic tarsitis**) reports the case of a woman aged fifty-six, without signs of syphilis, whose conjunctiva bled freely at the slightest touch. Nodules of a gristly hardness developed in the upper lid and made it more and more difficult to open the eye. A diagnosis of amyloid degeneration was made. The conjunctival hemorrhages and nose-bleed, which had also been present, finally ceased, leaving adhesive bands in the nasal cavities and between the lid-margins, as well as entropion. After treatment lasting more than six months, a blepharoplastic operation was done, and the nodules shelled out. These were found to consist of dense connective tissue like that of the tarsus, with syphilitic endarteritis obliterans and periphlebitis. There was no amyloid reaction.

LAGLEYZE (627, **operation of entropion**) has cured more than 300 cases of entropion and trichiasis of both lids in the following manner: A silk suture is armed with five or six curved needles, 3*mm* long, which are inserted at equal distances into the conjunctival aspect of the ectropionated lid, directly behind the upper margin of the tarsus, and brought out in the skin of the lid. With the needles in situ, an incision is made parallel to and 3*mm* from the lid margin, through conjunctiva and cartilage. The needles are then removed, leaving four sutures which are tied over a pledget of gauze on the lid margin, and removed in seven or eight days. The operation is simple and efficacious, and painless if subcutaneous injections of cocaine and adrenalin are used. V. MITTELSTÄDT.

SOMMER (628, **primary melanosarcoma of eyelids**) reports a case of melanosarcoma of the edge of the upper lid in a patient of eighty-two, which had been present five years, bled rarely,

caused no metastases, and had proliferated into the bulbar conjunctiva after some emigration of pigment.

HANKE (629, **plexiform neuroma of lid**) describes plexiform neuroma, which has a predilection for the eyelids, as a soft, diffuse growth which may have lobulated attachments. In these, hard, convoluted strands may be felt. The tumor is never malignant, but often causes pressure necrosis of neighboring bone. It is often congenital and inherited, appearing in childhood or at puberty. After traumatism or operative interference, rapid growth may be observed. The swelling yields to pressure and shows spontaneous variations like those of lymphangioma. Complete extirpation is difficult as the growths are not well defined. Histologically, numerous nerve fibres are found, with endo- and peri-neural proliferation, endothelial degeneration, and myxomatous changes in the connective tissue and nerve-trunks.

IX.—LACHRYMAL APPARATUS.

630. JACKSON, E. Traumatic dislocation of the lachrymal gland with a foreign body in the orbit. *Ophth. Record*, Aug., 1904.

631. SHOEMAKER, W. T. A case of bilateral enlargement of the lachrymal glands. *Annals of Ophth.*, July, 1904.

632. SNELL, A. C. Acute dacryoadenitis. *Ophthalmology*, Oct., 1904.

633. PES, O. Acute bilateral lachrymal adenitis in urethritis. *Arch. f. Augenheilk.*, li., 2, p. 144.

634. FORTUNATI, A. Tuberculosis of the lachrymal gland. *Annali di Ottalm.*, 1904, 10 and 11.

635. ROLLET, E. Gigantic ectasy of the lachrymal gland. *Annales d'ocul.*, cxxxii., p. 279.

636. CIRINCIONE, F. Extirpation of the lachrymal sac. *Clinica oculistica*, Aug., 1904.

637. BASSO, D. Extirpation of the lachrymal sac and canal. *Ann. di Ottalm.*, 7-8, 1904.

638. v. HYMMEN, H. Extirpation of the lachrymal sac. *Würtemb. Corresp.-Blatt*, Nov., 1904.

639. PETERS. Results of nasal examination in twenty-four cases of lachrymal fistula. *Münch. med. Wochenschr.*, 1905, No. 3, p. 147.

JACKSON (630, **dislocation of lachrymal gland**) reports the case of a man who fell on his head from a wagon, cutting open the lid over the upper orbital margin. The wound was sutured and healed by first intention, but swelling and redness persisted. The globe was displaced 13mm forward, 4mm downward, and 3mm inward. A hard mass in the outer part of the upper lid proved to be the dislocated tear gland. This was excised, but

the wound was opened subsequently, and pieces of wood were removed, at intervals, from the orbit. Thirteen cases of traumatic luxation of the tear gland were found. ALLING.

SHOEMAKER (631, **bilateral enlargement of lachrymal glands**) reports a case of symmetrical enlargement of the tear gland of four years' standing. Constitutional disturbances; in this case severe anæmia and possibly syphilis are ætiologic factors. The article contains a review of our present knowledge of diseases of the lachrymal gland. ALLING.

SNELL (632, **acute dacryoadenitis**), in an extensive search through literature, has found only 134 recorded cases of acute dacryoadenitis. He gives the clinical histories of two cases of abscess of the lachrymal gland, one of which was probably caused by the micro-organism of influenza. ALLING.

PES (633, **bilateral lachrymal-adenitis in urethritis**) saw four cases of gonorrhœa, complicated by sudden development of bilateral total dacryoadenitis. Suppuration did not ensue, nor were gonococci found in the tears or conjunctival secretion. The inflammation was probably due to toxines, and yielded promptly to simple local applications.

FORTUNATI (634, **tuberculosis of lachr. gland**) operated on a woman of sixty-two, removing a tumor of the tear gland which showed a tuberculous structure. No bacilli could be found, and animal experiments proved negative. CIRINCIONE.

ROLLET (635, **gigantic ectasy of lachrymal gland**) observed, in a man of sixty-seven an ectasia of the tear sac which had developed in two years and was the size of a walnut. After aspiration the sac was injected with paraffin and extirpated. Healing took place promptly and the epiphora disappeared. BERGER.

CIRINCIONE (636, **extirpation of lach. sac**) lays stress on the complete removal of the tear canal down to the nasal mucosa. This is followed by primary union and excludes relapses. After isolation of the sac, an incision is made in the aponeurosis which fastens the lower end of the sac to the wall of the bony canal. A part of the contents of the nasal canal is then separated with a special bayonet-shaped double-edged bistoury. The complete extirpation of the canal requires the use of the cautery, which is also employed to obliterate the puncta. Extirpation is indicated.

when the enlargement of the sac is marked, or associated with chronic nasal disease. CIRINCIONE.

BASSO (637, **extirpation of lachrymal sac and canal**) concludes from an anatomical study of several cases that the presence of an enlargement of the tear sac implies a partial or extensive organic stenosis of the canal with concentric contracture. The nasal canal must be removed if the operation is to be radical.

CIRINCIONE.

HYMMEN (638, **extirp. lachr. sac**) reports 85 % of cures in 171 lachrymal-sac extirpations at the Tübingen clinic; 15 % healed badly or had persistent epiphora or purulent secretion from the puncta. Patients under twenty-five give the poorest results. Most sac affections are found among the unskilled laborers. The radical operation is warmly recommended.

PETERS (639, **results of 24 nasal examinations of nose in lachr. fistula**) found accessory-sinus disease in just half of his cases of phlegmon or fistula in the region of the tear sac. In uncomplicated sac suppurations this element is lacking. The recognition of ethmoidal involvement requires repeated examination under cocainization.

X.—ORBIT AND ACCESSORY CAVITIES.

640. MORROW, E. P. **A case of foreign body within the orbit with penetration of the cranial cavity.** *Oph. Record*, Oct., 1904.

641. WÜRDEMAN, H. V. **Tumors of the eye and orbit.** *Four. Amer. Med. Ass.*, Dec. 17, 1904.

642. MACCALLUM, W. G., and CORNELL, W. B. **On the mechanism of exophthalmos.** *Med. News*, Oct. 15, 1904.

643. USHER, C. H. **Notes on cases of pulsating exophthalmos.** *Ophthalmic Review*, Nov., 1904.

644. VOSSIUS. **Krönlein's temporary resection of the orbital wall.** *Sitzungsber. d. medic. Gesellsch., Giessen*, June 21, 1904. *Deutsche med. Wochenschr.*, No. 49, 1904.

645. MAZZA, A. **Large ivory exostosis of the orbit.** *Ann. d'oculist.*, cxxxii., p. 419.

646. NICOLINI, T. **A case of dense orbital osteoma.** *Clinica oculistica*, July, 1904.

647. SWASEY, E. **Left exophthalmos of obscure origin.** *Ophth. Record*, June, 1904.

648. HOTZ, BENNO. **Exophthalmos and chorea cured by removal of adenoids.** *Berl. klin. Wochenschr.*, 1904, p. 91.

649. SCHLÜPMANN, E. **Two cases of pulsating exophthalmos cured by ligation of the common carotid.** *Inaug. Dissert.*, Tübingen, 1904.

650. BERNARD, H. L., and RIGBY, H. M. **Pulsating exophthalmos due to aneurysm of the internal carotid.** *Annals of Surgery*, May, 1904.

651. PICK, L. **A case of intermittent exophthalmos.** *Deutsche med. Wochenschr.*, 1904, No. 37, p. 1363.

652. GRUNERT, KARL. **Experiences in the surgery of the upper accessory cavities with special regard to post-operative oculo-muscular disturbances.** *Zeitschr. f. Augenheilk.*, xii., 6, p. 762.

IN MORROW'S (640, **foreign body penetrated through orbit into cranium**) case an explosion resulted in lodgment of the breech of a gun in the inner and upper walls of the orbit, leaving a large area of brain exposed. The eye was enucleated, and although orbital cellulitis ensued it subsided under irrigation and drainage and the patient made a good recovery. ALLING.

WÜRDEMANN'S (641, **tumors of eye and orbit**) contribution consists of a classification of tumors of the eye and orbit as a preliminary to a more extensive discussion of the whole subject.

ALLING.

MACCALLUM and CORNELL (642, **mechanism of exophthalmos**) in experimenting upon animals concerning exophthalmos made use of an apparatus consisting of a lever working on a pivot and recording changes in the position of the eyeball upon a revolving drum. They found that ligature of the internal jugular vein produced very little effect, while closure of the external jugular on the side observed was followed by marked exophthalmos, accompanied by œdema of the face and orbit. These later disappeared by the establishment of collateral circulation. Stimulation of the cervical sympathetic produced exophthalmos, and since this was also observed after the head of the dog had been severed from the body, the exophthalmos was likely to be independent of vascular changes. It seemed to be due to the contraction of the so-called muscular orbitalis of Müller, which is well developed in the dog, yet not entirely wanting in man. In two cases where opportunity was offered for stimulation of the cervical sympathetic in man there was no exophthalmos, but dilatation of the pupil. Hence the question of the cause of exophthalmos in Graves's disease is not solved. ALLING.

IN C. H. USHER'S (643, **cases of exophthalmos**) paper details are given of three cases of pulsating exophthalmos. No. 1 was a fatal case of traumatic origin. The patient was a fisherman who was shot in the head and face with a fowling-piece at a distance of twelve yards. When seen there was no P. L. in the right eye, and pulsation was felt through the lid. There was much proptosis, and the lids were greatly swollen and ecchy-

mosed. The globe scarcely moved in any direction, and the pupil was semi-dilated and inactive. There was a small wound at the upper and inner part of the upper lid. There were also other wounds about the head and face. Three days after the injury, the right external and internal carotids were ligatured just above the bifurcation ; the pulsation was then no longer felt. On the eighth day after the accident he had a sudden attack of dyspnœa, became comatose, and died. A careful dissection of the orbit was made, and a communication was found between some branches of the ophthalmic artery and the cavernous sinus. No foreign body was found within the orbit even with the X-rays, so that the somewhat unsatisfactory view had to be taken that the injury was caused by contrecoup. What part, if any, the ligaturing of the artery played in the development of the symptoms it was impossible to determine. The patient was an alcoholic subject. Case 2 was a shepherd, aged fifty-seven, who, on waking one morning, found a "stiffness" in the left eye, and noticed that it was redder than normal ; the sight was, however, as good as ever, and there had been no injury. The patient complained of noises in the head. He was a temperate man and had never suffered from gout, syphilis, or rheumatism ; he also had a good family history. The external and internal carotid arteries were ligatured close above the bifurcation. The bruit became much less and no pulsation could be felt. He attended seven years later with epithelioma of the lip, when it was found there was no bruit or pulsation, and he had been working as a shepherd ever since in a hilly district. His arteries, which were, when first seen, rather rigid, were now much more so. The cause of this case was probably an aneurysm of the internal carotid or ophthalmic artery. Case 3 was that of a girl aged four years, whose parents had noticed that for two months the left eye had been getting prominent. Two weeks previous to this the child had fallen down-stairs and had injured the left side of the face. She was unconscious for ten or fifteen minutes, and there was much bruising of the eyelids. When seen there was much proptosis with pulsation, which latter could be arrested by pressure on the carotid artery. The movements of the eyeball were unimpaired, and there was vision in the eye. The left common carotid artery was ligatured. The proptosis diminished but soon returned, while the bruit was always pres-

ent. Sixteen months later the symptoms were as bad as ever, the pupil was inactive, though objects could still be seen with the eye. The advantages claimed for ligaturing the internal and external carotids over ligaturing the common carotid, are that the collateral circulation from the branches of the opposite external is more effectually prevented, as also is that between the branches of the ophthalmic artery and those of the external carotid branches.

MARSHALL.

VOSSIUS (644, **Krönlein's operation**) reports the case of a woman with unilateral optic-nerve atrophy, in whom three years later there developed gradually increasing exophthalmos, ptosis, and œdema of the upper lid. Krönlein's operation failed to reveal an orbital tumor. This procedure need not be feared, even for exploratory purposes, as the cosmetic effect is good.

MAZZA (645, **large ivory exostosis**) saw a peasant girl of seventeen with $V = \frac{3}{4}$ and a dislocation of the globe toward the temporal side. An almost cubical osteoma, evidently arising from the ethmoid cells, was seized with volsellum forceps and removed after several attempts. The eye returned to its normal position, and motility was gradually restored.

BERGER.

NICOLINI (646, **dense orbital osteoma**) treated a case of osteoma of the median wall of the orbit ; the neighboring tissues of the upper lid showed lardaceous thickening and were extirpated. The bony tumor then disappeared.

CIRINCIONE.

SWASEY (647, **obscure large exophthalmos**) was consulted by a woman of twenty-four, of healthy appearance. Two months previously she had had an attack of paralysis of the left external rectus. Two months later exophthalmos developed, increasing steadily for one week without pain, congestion, or œdema about the eye. No orbital tumor could be felt. There was marked optic neuritis with bright spots at the macula suggesting albuminuric retinitis. The eye was totally blind. Kidneys, heart, and thyroid were normal. Inunctions, iodides, and faradism were used. After three months the nerve was atrophic, but the exophthalmos and the paralysis of the external rectus had disappeared. The ætiology of the case is obscure. Syphilis was probably not a factor.

ALLING.

HOTZ (648, **exophthalmos and chorea cured by adenotomy**) observed two boys in whom idiopathic double exophthalmos, undoubtedly due to a forme fruste of Graves's disease, disappeared

after removal of adenoid vegetations. In one case cure resulted after relapse and a second operation, double tonsillectomy having had no effect. Hotz concludes that abnormal secretions from lymphoid hypertrophy in the naso-pharynx may cause an intoxication of the central nervous system and induce Graves's disease. Of the three symptoms, goitre, tachycardia, and exophthalmos, the last is the most characteristic.

SCHLÜPMANN, E. (649, two cases of exophthalmos cured by ligation of common carotid).

BERNARD and RIGBY (650, two cases of exophthalmos cured by ligation of internal carotid) describe a case of gunshot wound of the base of the skull in which pulsating exophthalmos developed, and disappeared after ligation of the common carotid. The patient died, about two and a half months after the injury, of brain abscess. Autopsy showed two sacculated aneurysms of the cranial portion of the carotid, one at the petrosal curvature, the other near the posterior portion of the cavernous sinus. The latter was not connected with the carotid, showing that pulsating exophthalmos may develop without a direct arterio-venous connection. ALLING.

PICK'S (651, intermittent exophthalmos) case is undoubtedly one of varix of a branch of the ophthalmic vein probably due to syphilitic endophlebitis.

GRUNNERT (652, surgery of accessory cavities) has developed, in the Halle ear clinic, a frontal sinus operation which has given him excellent results. Adopting Kuhnt's suggestion to obliterate the cavity, he then opens up the labyrinth of the ethmoid, with a modification of Kilian's method.

XI.—CONJUNCTIVA.

653. **STANDISH, MILES. The treatment of purulent conjunctivitis.** *Four. Amer. Med. Asso.*, Dec. 17, 1904.

654. **STIRLING, J. W. and MCCRAE, JOHN. A case of Parinaud's conjunctivitis with pathological report.** *Ophthalmic Review*, Oct., 1904.

655. **GERLOFF. Note on the use of quinine in external inflammations of the eye.** *Klin. Monatsbl. f. Augenheilk.*, xlii., 2, p. 483.

656. **VOSSIUS. A case of purulent conjunctivitis and irido-cyclitis of both eyes after dysentery.** *Ophthalm. Klinik*, 1904, No. 2.

657. **MATYS, W. A case of Parinaud's conjunctivitis.** *Zeitschr. f. Augenheilk.*, xii., 4, p. 557.

658. **DE FALCO, ANDREA. The pathogenesis of vascular, secretory,**

and nodular affections of the conjunctiva and neighboring mucous membranes. *Ann. di Ottalm.*, 10 and 11, 1904.

659. GORTAGOW. Comparative treatment of trachoma with sublimite-glycerine, 1 % silver nitrate, and 1 % ichthargan. *Allg. med. Central-Zeitg.*, 1904, No. 51.

660. BOCK, E. The treatment of trachoma with cupro-citrol (Arlt). *Aerzt. Central Zeitg.*, Vienna, 1904, No. 51.

661. HEISRATH, FR. On the treatment of granular ophthalmia with special regard to operative procedures. Posth. Ed. by Pollnow, 1904, Leipsic.

662. COHN, H. The cure of trachoma by radium. Preliminary note. *Berl. klin. Wochenschr.*, 1905, No. 1.

663. CONTINO, A. Tuberculous ulcer of the tarsal conjunctiva. *Clin. oculist.*, Nov.-Dec., 1904.

664. CAPOLOGO, CARLO. Contribution to the clinical and anatomic study of serous cysts of the fornix fold. *Ann. di Ottalm.*, No. 5, 1904.

665. TERSON, A. Extensive lymphangiectasy of the bulbar conjunctiva. *Soc. d'ophthalm. de Paris*, Nov. 8, 1904.

666. HESS. On ophthalmia neonatorum. *Med. Klinik*, 1904, No. 3.

The position taken by STANDISH (653, **treatment of pur. conjunctivitis**), which he supports by statistics taken from the records of the department of the Mass. Charitable Eye and Ear Infirmary devoted to contagious diseases, cannot be better stated than by quoting his conclusions: The newer silver salts are more easily applied, safer in use, and produce better results than nitrate of silver. In cases of ophthalmia neonatorum, either protargol or argyrol is an entirely satisfactory agent. In cases of gonorrhœal ophthalmia, in the adult the results obtained, if treatment is begun early, are approximately the same with either preparation, but when the cornea is affected protargol appears to be better. His final, somewhat radical, statement is to the effect that the application of cold during the stage of swelling is a dangerous procedure and should be abandoned. ALLING.

The disease reported by STIRLING and MCCREA (654, **Pari-naud's conjunct. with pathologic report**), lymphoma of the conjunctiva as the Germans call it, is one of which hardly any mention is made in text-books. It is characterized by large follicular masses on the palpebral conjunctiva, with enlargement and even suppuration of the neighboring lymphatic glands. There is a rise of temperature each evening even up to 103° , and as a rule one eye only is affected. It runs a slow course and tends toward recovery. The patient was first seen in Nov., 1903, and the right eye had then been inflamed for 10 days. There were

marked swelling and irritation of both lids, which were granular on their inner surfaces. Trachoma was diagnosed provisionally and nitrate of silver, 2 %, was used. In 48 hours the condition had spread and organisms very like the Klebs-Loeffler were found. A mouse inoculated died in two days. In the eye a false membrane developed and the pharynx became ulcerated, but a bacteriological examination of the throat proved negative. The temperature was high and the glands were enlarged. Parinaud's conjunctivitis was then diagnosed. Antidiphtheritic serum of Roux was used, but did no good. The swollen glands which were breaking down were then excised, and a rapid amelioration of the disease at once set in, so that in two months the condition was cured. A detailed account of the bacteriological condition is given, and the conclusion is arrived at that the condition was due either to a virulent form of the bacillus xerosis or to a less toxic form of the bacillus diphtheriæ.

MARSHALL.

GERLOFF (655, **quinine in external inflammations**) has had good results in trachoma, hypertrophic catarrh, and similar severe catarrhs of the eye from the internal administration of quinine, 8 grains pro die for an extended period.

VOSSIUS (656, **purulent conjunctivitis and iridio-cyclitis in dysentery**) reports the development, in the third week of dysentery, of urethritis and conjunctivitis with scanty muco-purulent discharge in which a micro-organism was found very similar to the bacterium coli commune. The lids became greatly swollen; keratitis, iritis, and vitreous turbidity developed, all of which yielded to calomel and aspirin-diaphoresis.

MATYS (657, **case of Parinaud's conjts.**) describes a severe attack of Parinaud's disease which is characterized by its localization on the conjunctiva, early swelling of the parotid and submaxillary glands, and slight fever. The glands occasionally suppurate. The chemotic conjunctiva shows numerous yellowish-gray nodules and secretes freely. This invariably heals—in Maty's case after ten months. The cornea is not affected. Generally, one eye only is involved. Tuberculosis and glanders are the only other affections which would be thought of in a differential diagnosis. The cause of the simultaneous affection of conjunctiva and lymph glands is unknown.

DE FALCO (658, **pathogenesis of nodular affections of**

conj.) believes the etiology of trachoma to be anatomical, based on the adenoid structure of the conjunctiva. The vasomotor and secretory centre of the eye is the ciliary plexus, which is affected by the products of exertion of the ciliary muscle. All nodular affections of the ocular and nasal mucosæ are anatomic consequences of eye-strain. Treatment must aim to improve the general condition, counteract the morbid irritability of the ciliary plexus, and bring about resorption of the nodules.

CIRINCIONE.

GORTAGOW (659, comparative treatment of trachoma) concludes from his observations that ichthargon gives a higher percentage of cures than bichloride or silver and is less apt to irritate or cause argyrosis. Pannus, too, yields to applications of a 1 % solution.

HIRSCHMANN.

BOCK (660, treatment of trachoma with cupro-citrol) recommends copper citrate as the best application in advanced trachoma with cicatricial changes, and particularly for pannus. The fact that the patient can apply the remedy himself, twice daily, in the form of a 5 % or 10 % salve and go about his business is a decided advantage.

HEISRATH'S (661, treatment of trachoma with radium and other remedies) contribution is an almost complete presentation of his experience with the operation, which he first carried out in a routine manner, of removal of the tarsus and diseased conjunctiva in old trachoma with pannus. Pollnow upholds Heisrath's priority in this procedure as against Kuhnt, who advised the extirpation of the tarsus alone.

COHN (662, cure of trachoma by radium) was able to bring about the rapid disappearance of trachoma follicles, which had been treated in vain for months, by exposing them to the emanations from one milligram of radium enclosed in glass. The procedure is not only painless but absolutely harmless, as only a small quantity was used, and the radiation was allowed to act only ten to fifteen minutes.

CONTINO (663, tuberculous ulcer of the tarsal conjunctiva) reports a case of tuberculous ulcer of the palpebral conjunctiva in which animal experimentation (on rabbits) and bacteriologic examination were positive. Local and constitutional treatment with Maragliano's serums (serum anticorpus and serum antitoxi-

cum) was followed by cicatrization of the ulcer. The patient, a girl of ten, died two months later of meningitis.

CIRINCIONE.

CAPOLONGO (664, **serous cyst in the fornix fold**) reports on the histologic examination of three cases of cysts of Henle's glands, showing, in all, hyaline degeneration of the epithelial layer lining the inner wall. Cystic dilatation of a duct of a Krauserian gland is also described.

CIRINCIONE.

TERSON (665, **lymphangiectasia of bulbar conjunctiva**) presented a patient with marked ectasia of the lymph-vessels in the bulbar conjunctiva. There was no conjunctivitis, or swelling of the lymph-glands. The enlarged lymphatics, which look like white threads, form several distinct groups: one, horizontal, on the temporal side; others above and below the cornea, and two on the nasal side, above and below, respectively; the last terminating in a plexus bordering on the semilunar fold.

BERGER.

HESS (666, **ophthalmia neonatorum**) is convinced that Credé's instillations never do harm. Their use by midwives should be obligatory rather than elective. Succedanea for nitrate of silver, particularly protargol, are condemned. As gonococci are found many days after suppuration has ceased, it is advisable to continue the 1% solution of silver for some time.

XII.—CORNEA, SCLERA, ANTERIOR CHAMBER.

667. WEEKS, J. E. **Deposit of silver in the epithelial layer of the cornea.** *N. Y. Eye and Ear Inf. Repts.*, Jan., 1904.

668. LEOPOLD, G. **Herpes zoster ophthalmicus.** *Inaug. Diss.*, Tübingen, 1904.

669. ELIASBERG. **Treatment of scrofulous eyes.** *Klin. Monatsbl. f. Augenheilk.*, xlii., 2, p. 456.

670. EWING, A. E. **Bullous keratitis: fatty degeneration of Bowman's membrane.** *Am. Journ. of Ophthalm.*, June, 1904.

671. VILLARD, H. **Corneal affections in acquired syphilis.** *Annales d'oculist.*, cxxxii., p. 253.

672. STANCULEANO, G. **Studies in the diagnosis and treatment of parenchymatous keratitis with tuberculin T.** *Ann. d'ocul.*, cxxxii., p. 340.

673. TRANTAS. **Malignant parenchymatous keratitis and pregnancy, induced labor, recovery.** *Arch. d'opht.*, xxiv., No. 12, p. 783.

674. MARTIN, A. **On the occurrence of a bacterial sword on the eye.** *Arch. f. Augenheilk.*, li., 2, p. 141.

675. MORAX, V. **Annular abscess of the cornea and its significance.** *Ann. d'ocul.*, cxxxii., p. 409. Illustrated.
676. ZUR NEDDEN. **Infectious marginal ulcer of the cornea.** *v. Graefe's Arch. f. Ophth.*, lix., 2, p. 360.
677. COLOMBO, G., and RICCHI, G. **Contribution to the pathologic anatomy of hypopyon keratitis.** *Annali di Ottalm.*, No. 12, 1904.
678. NERLI, G. **Contribution to the treatment of infiltrating keratitis and corneal abscess.** *Clin. oculist.*, Nov.-Dec., 1904.
679. ZELLER, O. **The treatment of serpent ulcer with pneumococcus serum.** (Römer) *Württemb. medic. Corresp.-Bl.*, No. 1, 1904.
680. SCHULTE. **The treatment of ulcus serpens.** *Ophthalm. Klinik*, No. 1, 1904.
681. ZUR NEDDEN. **Clinical experience in the treatment of ulcus serpens with Römer's pneumococcic serum.** *Klin. Monatsbl. f. Augenh.*, xlii., 2, p. 552.
682. YOUNG, H. B. **Microcornea without microphthalmus.** *Annals of Ophthal.*, Oct., 1904.
683. VEASEY, C. A. **Report of a case of spring catarrh simulating malignant new-growth of the corneal limbus.** *Amer. Jour. Med. Sci.*, May, 1904.
684. DEL MONTE, A. **Melanotic sarcoma of the limbus infiltrating the cornea.** *Annali di Ottalm.*, No. 10-11, 1904.
685. BELL, G. H. **Melanosarcoma of the limbus in an eye with normal vision, followed by enucleation.** *Arch. f. Ophth.*, xxxiii., 6, p. 579.
686. FRAENKEL. **A case of professional scleral rupture.** *Pract. Wratsch*, 1904.

WEEKS (667, **deposit of silver in epithelium of cornea**) saw two cases in which, after silver nitrate had been used for an ulcer of the cornea, a black deposit was found in the corneal tissue. It was probably thrown out of solution as a chloride, and afterwards reduced to metallic silver. ALLING.

LEOPOLD (668, **herpes zoster ophthalmicus**) describes in detail a case of herpes zoster in the region of the ophthalmic branch of the trigeminal. The ocular symptoms were anæsthesia and eruption of vesicles on the cornea, iritis with deposits on Descemet's membrane, progressive nuclear opacity in the lens, and transitory ptosis.

ELIASBERG (669, **treatment of scrofulous eyes**) treats severe scrofulous inflammation of the cornea with a salve composed of mercuric oxide 1 %, cocaine, atropine, and silver nitrate, $\frac{1}{2}$ %. It is put up in a black salve pot.

EWING (670, **bullous keratitis, fatty degeneration of Bowman's membrane**) reports in detail on the histological examination of a glaucomatous eye in which a bullous keratitis had

developed. The formation of vesicles occurs in four stages: first, fatty degeneration of Bowman's membrane with thickening of the epithelial layer; second, further degeneration of the anterior limiting membrane with involvement of the corneal stroma,—the basal cells of the epithelium are absorbed; third, formation of a cyst-wall and proliferation of epithelial cells; finally, fibrin leucocytes and spindle cells appear in the vesicle, and, later, blood-vessels develop. ALLING.

VILLARD (671, **corneal affections in syphilis**) draws attention to a circumscribed form of parenchymatous keratitis which is less well known than the more common diffuse variety. It is almost always accompanied by iritis, which may run a malignant course or be complicated with choroiditis. In Villard's cases, intramuscular injections of biniodide of mercury brought about a complete cure. BERGER.

STANCULEANO (672, **parenchymatous keratitis treated with tuberculin**) examined a specimen of keratitis parenchymatosa from a young girl who had had this affection for a year and had died of pulmonary tuberculosis. An "internal" ulcer was found in the form of destruction of the deeper layers of the cornea, and of the iris where it adhered to these points. The anterior layers of the cornea and Bowman's membrane were not affected.

STANCULEANO (672) used tuberculin T dissolved in 2 % carbolic acid to determine whether parenchymatous keratitis has a tubercular basis. Of eight patients with this form of keratitis, five showed a rise of temperature, with increase of local inflammation and of the corneal opacity. In two cases, prolonged use of tuberculin was followed by a clearing of the corneal opacity. BERGER.

TRANTAS (673, **malignant parenchymatous keratitis and pregnancy**) observed a severe case of parenchymatous keratitis in a woman of twenty-seven with hereditary syphilis, in the eighth month of pregnancy. In spite of energetic treatment with mercury, phthisis bulbi ensued. In a later pregnancy, the other eye became affected in exactly the same way and became rapidly worse in spite of treatment as before. The inference that the pregnancy alone was the cause of this ominous course was borne out by the result of induced labor. A marked improvement immediately followed, and gradually the eye got well.

V. MITTELSTÄDT.

MARTIN (674, **bacterial sward on eye**) saw a patient who had a bit of chaff lying with its concave surface on the cornea. The convexity was covered with a rich sward of coryne bacteria which did not grow when removed from this nidus.

MORAX (675, **annular abscess of cornea**) saw a woman of forty-seven with double metastatic ophthalmia due to pneumococci. The primary affection seems to have been in the lung. The patient had general sepsis and ulcerative endocarditis. Ring abscess of the cornea developed in one eye, necessitating enucleation; death three days later. The specimen showed purulent irido-choroiditis and a massive invasion of pus cells at the limbus. The cornea contained no pneumococci, which were present in large numbers in the anterior chamber. Morax agrees with Fuchs that the ring abscess of the cornea is caused by the toxines of the cocci in the anterior chamber.

BERGER.

ZUR NEDDEN (676, **infectious marginal ulcer**) has studied sixty-five more cases of marginal ulcer due to the bacillus found by him three years ago, and finds his original theories confirmed. The disease develops spontaneously in the aged. The specific micro-organism develops in the conjunctival sac, which it does not affect.

COLOMBO and RICCHI (677, **pathology of hypopyon keratitis**) examined a corneal ulcer with hypopyon in an eye blind from absolute glaucoma. The pneumococcus was found, but only on the margin and in the superficial layers of the base of the ulcer. The destruction of Descemet's membrane, the hypopyon, and the iritis were due to the toxines of the pneumococci.

CIRINCIONE.

NERLI (678, **treatment of infiltration and abscess of cornea**) prefers to use eserine in hypopyon keratitis, unless iritis is present. In that case he uses eserine and atropine alternately. Iodoform is preferred to silver.

CIRINCIONE.

ZELLER (679, **treatment of serpent ulcer by pneumococcic serum**) used Römer's pneumococcic serum in fourteen cases of *ulcus serpens*, but had good results in only two, both young patients. In other cases requiring the use of the cautery, the serum appeared to have beneficial effect at times; in some it was quite useless.

SCHULTE (680, **treatment of *ulcus serpens***) makes a minute

perforation at the base of serpent ulcers with the galvano-cautery, and each day uses a spud to remove the yellowish-white mass which plugs the opening. This is continued until the ulcer is clean. The principle is the same as that of the Saemisch incision, *i. e.* to improve the nutrition of the cornea by suspending the anterior chamber, and has the advantage of avoiding anterior synechiæ.

ZUR NEDDEN (681, **treatment of ulcus serpens with Römer's pneumococcic serum**) treated 14 cases of serpent ulcer with hypodermic injections of Römer's serum, and was successful in two. In these, the ulcers were about 1mm in diameter. Their nature was only recognized by cultures. Larger ulcers, particularly those of adults, were not improved by the serum, even when large doses were injected. The presence of pneumococci in the ulcers could be demonstrated by cultures at all times.

YOUNG (682, **Microcornea without microphthalmus**). *Ann. of Ophthalm.*, Oct., 1904.

VEASEY (683, **spring catarrh simulating tumor**) describes a tumor which clinically and histologically resembled a sarcoma, but which proved to be a hypertrophic catarrh of the limbus, which had been present in one eye for nearly three years before the other became affected.

ALLING.

Sections XIII.-XVIII. Reviewed by DR. O. BRECHT, Stettin.

XIII.—LENS.

687. VOSSIUS, A. (Giessen). **Goitre and cataract.** *Zeitschr. f. klin. Med.*, vol. lv.

688. CALHOUN, A. W. **Is bilateral cataract extraction justifiable?** *Four. Am. Med. Assn.*, Dec. 24, 1904.

689. WRIGHT, R. H. **Report of cataract extractions.** *N. Y. Eye and Ear Inf. Repts.*, Jan., 1904.

690. KOSLOWSKI (Kiew). **On the treatment of posterior capsular cataract.** *Arch. f. Augenheilk.*, li., p. 105.

691. BONAMICO, M. **Observations on the extraction in the capsule.** *Clinica oculist.*, Nov.-Dec., 1904.

692. VALUDE. **Expulsive hemorrhage following extraction.** *Soc. d' ophth.*, 1904, p. 759.

693. DEMARIA, E. B. **Experimental research on the production of cataract by massage of the lens.** *Arch. f. Ophth.*, lix., p. 568.

694. SAEFFNER, O. **On the pathogenesis of naphthalin cataract.** *Arch. f. Ophth.*, lix., p. 520.

695. DE LAPERSONNE and POULARD. **On preliminary capsular**

discission. *Soc. d'opht. de Paris*, Nov. 8, 1904.

695A. **BOCCHI, A.** The elimination of bandaging after cataract operation. *Ann. di Ottalm.*, No. 10-11, 1904.

695B. **PAON.** Mechanism of rupture and subconjunctival dislocation of the lens (pathological anatomy and pathogenesis). *Ann. d'oculist.*, cxxxii., p. 330.

695C. **BELLINZONA, C.** Subconjunctival dislocation of the lens. *Gazz. med. lombard.*, No. 44, 1904.

695D. **THOMSON.** Observations on the pathology of the crystalline lens. *Ann. of Ophth.*, 1904, p. 539.

VOSSIUS (687, goitre and cataract) has observed 28 cases of cataract complicating goitre. In the great majority of these, particularly the pre-senile, the opacity is nuclear. The lens changes are probably secondary to ocular disease from disturbance of nutrition dependent on constitutional disorders.

CALHOUN (688, bilateral extraction not justifiable) expresses his firm conviction that double cataract extraction is unjustifiable.

ALLING.

WRIGHT (689, statistics of cataract at N. Y. Eye and Ear Infirmary) gives data of 247 cataract-extractions: 120 were simple, with iridectomy, 6 linear, 1 capsular, 2 in excessive myopia, 1 congenital. There were 8 cases of iris prolapse, 2 of intra-ocular hemorrhage, 7 of panophthalmitis, and 100 of iridocyclitis.

ALLING.

KOSLOWSKI (690, extraction of unripe cataract) extracts the clear lens in the capsule in cases of posterior capsular cataract; 21 cases from ten to forty years of age. Resulting vision satisfactory. A secondary discission is generally required.

BONAMICO (691, extraction with capsule) shows that the maturity of the cataract may be left out of consideration in extraction in the capsule. The section must be large and entirely corneal. Escape of aqueous is apt to occur if the lens is turned round. This should be avoided if possible.

CIRINCIONE.

VALUDE (692, expulsive hemorrhage) reports the case of a man of fifty-four. Four days after a normal cataract extraction the iris prolapsed and was immediately abscised. On the following day expulsive bleeding took place, and sight was lost. The lateness of this hemorrhage is remarkable and may have been connected in some way with the prolapse of the iris.

BERGER.

DEMARIA (693, **artificial ripening of cataract**) shows that massage of the lens produces primarily a mechanical tearing, detachment, and wrinkling of the epithelial layer on the anterior capsule. This opens the way for imbibition with aqueous, with a second stage of degeneration in the epithelium and cloudy swelling of the lens fibres. The latter may be broken up if the massage be very vigorous. The capsule itself always remains intact.

SAEFFNER (694, **pathogenesis of naphthalin cataract**) concludes that it is not the naphthalin itself, but a product of its decomposition, circulating in the blood, which damages the eye. This body has not been isolated. The capsular epithelium of the lens shows changes long before the ciliary body appears to be affected. The first changes consist in swelling of the fibres. Naphthalin cataract is very much like that observed in glass-blowers, after lightning stroke, and after massage, in all of which, by thermic, mechanical, chemical, or electrolytic action, the lens capsule is injured and imbibition of the lens fibres with opacification results.

DE LAPERSONNE and POULARD (695, **preliminary capsular discission**) recommend early discission of secondary cataract. In thirteen combined extractions, the secondary operation was performed on the sixteenth or seventeenth day. The elasticity of the after-ataract, which soon disappears, allows a wide retraction of the split membrane if the operation be performed early. The time is determined by the more or less rapid healing of the extraction wound, and by the amount of irritation present. The pupil is dilated and a sickle-shaped needle, with flexible shaft, introduced through the sclera, above the site of section, and carried behind the secondary cataract, through which it cuts on being withdrawn.* After simple extraction the same procedure would be indicated, and transfixing of the peripheral portion of the iris would be of no moment if the pupil were fully dilated.

V. MITTLESTÄDT.

VALUDE (695, **answers the preceding authors**) answers the preceding authors by calling attention to the fact that in Hasner's discission of the capsule only a small quantity of

* De Lapersonne has abandoned the introduction and cutting from behind.
H. K.

vitreous gets into the anterior chamber, so that there can be no question of a loss of vitreous. This procedure is indicated in traumatic cataract, after removal of the artificially opacified lens in high myopia, and in those cases in which, after cleaning the pupillary area, a grayish opacity remains. The results are uniformly good.

BERGER.

Bocchi (695A, **elimination of bandaging**) expresses the opinion that the open treatment of cataract extraction is rational and progressive, marking a distinct advance. Fuchs's method is the best, as the operated eye is protected against injury, the first and most important consideration.

CIRINCIONE.

PAON (695B, **subconjunctival dislocation of the lens**) examined a globe which had been struck near the inner canthus. There was a rupture of the sclera on the temporal side, 6mm long, running $1\frac{1}{2}$ mm from the limbus. The lens was dislocated, partly into the anterior chamber, and partly under the conjunctiva.

BERGER.

BELLINZONO (695C, **dislocation**) describes a case of subconjunctival dislocation of the lens, following indirect injury in the neighborhood of the brow. The sclera was ruptured at the insertion of the external rectus. Fifty-four days after the injury the nucleus was still fairly well preserved; the peripheral layers were reduced to amorphous detritus; the hyaloid membrane was absent.

XIV.—IRIS.

696. LEHMANN, J. **Gonorrhœal metastatic iritis.** *Inaug. Diss.*, Berlin, 1904.

697. UTHOFF. **Metastatic carcinoma of the ciliary body.** *Deutsche med. Wochenschr.*, 1904, p. 1423.

698. SCHIECK, F. **Pigmented cysts on the posterior surface of the iris.** *Klin. Monatsbl. f. Augenheilk.*, xlii., 2, p. 341.

699. RABITSCH, F. **On interepithelial uveal cysts.** *Centralbl. f. prakt. Augenheilk.*, xxviii., p. 321.

700. PRAUN, E. **Detachment of the pigment layer of the iris and prolapse of the flap through the pupil.** *Centralbl. f. prakt. Augenheilk.*, xxviii., p. 296.

701. FEJÉR, T. **On resorption of torn-off iris tissue in the globe.** *Centralbl. f. prakt. Augenheilk.*, xxviii., p. 289.

702. FRENKEL. **Balance mydriasis or oscillating pupillary inequality.** *Arch. méd. de Toulouse*, Oct. 15 and Nov. 1, 1904.

703. SATTLER, H. **The re-introduction of iridodesis.** *Klin. Monatsbl. f. Augenheilk.*, xlii., 2, p. 469.

704. COSMETTATOS, G. F. **Atypical, partial bilateral coloboma of the iris.** *Arch. d'opht.*, xxiv., No. 11, p. 720.

705. MAGNANI, C. **Clinical contribution to the study of the innervation of the iris.** *ARCH. OF OPHTH.*, xxxiii., 6, p. 591.

LEHMANN (696, **metastatic gonorrhœal iritis**) reports ten cases of metastatic iritis of gonorrhœal origin from Greeff's clinic, and describes the clinical picture in detail.

UHTHOFF (697, **metastatic carcinoma of ciliary body**) observed, in a man of forty-nine, an isolated apparently metastatic carcinoma of the ciliary body, in the lower quadrant of the left eye. The rest of the globe was sound. Severe inflammatory reaction and secondary glaucoma soon appeared. The primary tumor was not found, but the assumption of a carcinoma of the intestinal tract seemed justified by the symptoms. Post-mortem was refused. The non-effect of antisyphilitic treatment confirmed the diagnosis of carcinoma. Sarcoma could be excluded on the strength of the clinical picture.

SCHIECK (698, **pigmented cyst on posterior surface of the iris**) calls attention to the differential diagnosis between melanosarcoma and pigmented cyst of the iris, and its importance on account of the treatment to be carried out in either case. He reports one instance in which the clinical appearance led to the mistaken diagnosis of sarcoma, and adds a similar case which was observed by chance.

RABITSCH (699, **on interepithelial uveal cysts**) reports the chance finding of a cyst of the ciliary process in the myopic eye of a man of fifty-four.

PRAUN (700, **detachment of the pigment layer of the iris**) examined a woman of fifty with high myopia and contusion of the globe. The posterior layer of the iris had been partially peeled off and protruded into the anterior chamber.

FEJÉR (701, **resorption of torn-off iris-skirt**) observed the spontaneous resorption of a torn-off shred of iris tissue in an injured eye. The patient was a woman of thirty-seven.

FRENKEL (702, **balance mydriasis**) describes as mydriasis à bascule (balance), a form of oscillating dilatation which is invariably due to preceding spasm of the dilatator (sympathetic irritation). This symptom is not necessarily of unfavorable prognostic

significance, as claimed by Mendel and Hirschberg, for it occurs not only in incipient paresis, but in tabes, multiple sclerosis, neurasthenia, and internal diseases such as phthisis, as well.

BERGER.

SATTLER (703) advises iridodesis in appropriate cases of ectopia lentis, and reports a case operated on with good result.

COSMETTATOS (704, **typical bilateral coloboma**) observed, in a youth of eighteen with various cranial deformities, a coloboma downward and outward, from the base of which a groove ran curving outward and upward to the root of the iris. A similar defect was found in the other eye. In both, the coloboma was limited to the mesodermal layer, the layer of retinal pigment remaining intact.

V. MITTELSTÄDT.

MAGNANI (705) reports mydriasis following contusion of the right eye in a young woman of twenty-five. Although there was neither direct nor consensual reaction to light, the pupil contracted promptly with convergence. Magnani is unable to offer any satisfactory theory in explanation of his observation.

ABELSDORFF.

XV.—CHOROID.

706. FUCHS, E. **Histologic changes in choroidal inflammation.** *Arch. f. Ophth.*, lviii., p. 391.

707. LEWIS, I. D. **Triple rupture of the choroid.** *Ophth. Record*, July, 1904.

708. ZASKIN. **A case of ossification of the choroid.** *Wojenno med. T.*, Oct., 1904.

709. PES, O. **Hyaloid bodies and papillary growths of the choroid.** *Arch. f. Ophth.*, lix., 3, p. 472.

710. RUMSCHEWITSCH, K. **Histology of so-called "Drusen" (nodules) of the lamina vitrea of the choroid.** *Klin. Monatsbl. f. Augenh.*, xlii., 2, p. 358.

711. FLEISCHER, B. **A contribution to the knowledge of choroidal new-growths.** *Klin. Monatsbl. f. Augenh.*, xlii., 2, p. 353.

712. BAQUIS, E. **Contribution to the knowledge of the structure and histogenesis of angiosarcoma of the choroid.** *Ann. di Ottalm.*, 7-8, 1904.

FUCHS (706, **pathology in choroiditis**) gives a systematic description of the anatomic changes found in choroidal inflammations and discusses more particularly the changes found after acute purulent processes in the pars ciliaris retinæ, retina, choroid, and subchoroidal layer. A detailed analysis of the various degrees of inflammatory thickening of this layer is added.

LEWIS (707, **triple choroidal rupture**) considers the following interesting features of his case : Two months after injury of the eye, three typical choroidal ruptures were seen : one in the nasal half of the fundus ; a second, vertical, on the temporal side ; and a third, horizontal, near the macula. There was no deposit of pigment along the margins. Near the macula there were a number of small whitish spots. ALLING.

ZASKIN (708, **ossification of choroid**) examined an eye which had been enucleated fifteen years after being struck with a whip. In the choroid three points of ossification were found, the largest being situated near the nerve-head. The bone consisted of concentric lamellæ with bone-corpuscles and Haversian canals containing cellular elements. This production of bone took place on inflammatory connective tissue.

HIRSCHMANN.

PES (709, **hyaloid bodies and papillary growths**) holds that hyaline warty growths (Drusen) of the lamina vitrea of the choroid may be the result of degenerative changes in the retinal pigment epithelium, or may develop in inflammatory processes, particularly those of the deeper layers of the choroid. The two forms are not to be confounded.

RUMSCHEWITSCH (710, **hyaloid nodules**) found warty growths (Drusen) of the hyaloid membrane of the choroid in four youthful eyes. These nodules always develop at the expense of the cells of the pigment epithelium, and contain lime deposits. Their formation does not depend on any activity of the lamina vitrea, and occurs as a senile change as well as in acute inflammatory processes. In the latter case the nodules are most numerous near the diseased area, in the vicinity of the nerve-head, and in the periphery. Changes in the chorio-capillaris probably cause these growths.

FLEISCHER (711, **choroidal new-growths**) found, in a man of sixty-five, a poorly pigmented and vascularized spindle-cell sarcoma, which, almost completely surrounding the nerve-head, had grown into the vitreous and split the retina into two layers. Proliferations of the tumor were found in the nerve, posterior ciliary vessels, pigment epithelium, and retina.

BAQUIS (712, **angiosarcoma of choroid**) concludes from a careful histologic study of a case of his own that non-pigmented

angiosarcomata may originate, not only in the chorio-capillaris, but in the pigmented layers of the choroid as well. A non-pigmented angiosarcoma may become a pigmented sarcoma in consequence of gradual pigmentation of originally colorless neoplastic elements; the formation of pigment within the sarcoma cell is a metabolic process of cell activity, although the basic material is supplied by the blood.

CIRINCIONE.

XVI.—VITREOUS.

713. ELSCHNIG. **Detachment of the vitreous.** *Wien. med. Presse*, 1904, No. 50. *Klin. Monatsbl. f. Augenheilk.*, xlii., 2, p. 529.

714. FELIX, C. H. **Vascular loop in the vitreous.** *Geneesk. Tydschr. f. Nederl. Ind.*, xliv., part 9.

715. JOHNSTON, R. N. **Bacteriology of panophthalmitis.** *Med. News*, Aug. 20, 1904.

ELSCHNIG (713, **detachment of vitreous**) examined seventeen globes with myopia of from two to thirty dioptries, and five with atypic myopic refraction. In only four eyes was there an apparent detachment of the vitreous. On careful examination numerous fine strands of what looked like vitreous adhered to the retina. Microscopic study confirmed this, and showed that remnants of the limiting membrane were still attached to the retina. This finding corresponds completely with what Arlt described as fluidification of the vitreous. Elschnig's investigations disprove the assumption that detachment of the vitreous frequently complicates posterior staphyloma.

JOHNSTON (715, **bacteriology of panophthalmitis**) comes to the conclusion that the pneumococcus is the specific germ in the causation of panophthalmitis, although there are cases of mixed infection due to staphylococci and streptococci.

ALLING.

XVII.—GLAUCOMA.

715A. WHITE, J. A. **Simple glaucoma or primary atrophy.** *Ophth. Record*, Oct., 1904.

716. DEMARET, J. **Osmotic pressure of intraocular fluids in glaucoma.** *Arch. d'ophth.*, xxiv., No. 11, p. 709.

717. PETERS, A. **On glaucoma following contusion of the globe, and its treatment.** *Klin. Monatsbl. f. Augenheilk.*, xlii., 2, p. 545.

718. BELTMAN, J. **On congenital teleangiectasis of the eye as a cause of glaucoma simplex.** *Arch. f. Ophth.*, lix., p. 502.

719. ZAHN, E. **On the hereditary conditions in buphthalmus.** *Inaug. Diss.*, Tübingen, 1904.

720. CARBONE, A. **On the action of iridectomy in glaucoma.** *Clin. oculist.*, Sept., 1904.

721. SCHMIDT-RIMPLER. **Histologic study on the origin of glaucomatous excavation.** *Arch. f. Ophth.*, lviii., p. 563.

WHITE (715A, **simple glaucoma or primary atrophy**) discusses the question, which at times occurs to all ophthalmologists, of the differential diagnosis between simple glaucoma and optic-nerve atrophy. He reports a case in which the visual field of the right eye was contracted, especially above and toward the nasal side, and vision had fallen to $\frac{2}{80}$. There was no increase of intraocular tension, but a central excavation of both disks, with some pallor of the right nerve-head. Strychnine improved the sight, but after iridectomy in the right eye a relapse soon occurred. White inclines to the diagnosis of optic-nerve atrophy.

ALLING.

DEMARET (716, **osmotic pressure in glaucoma**) used Hamburger's method of hæmolysis for the determination of osmotic pressure in two cases of glaucoma. In both, this was found to be lower than the pressure of the blood serum, so that the increase of tension could not be explained by osmosis.

V. MITTELSTÄDT.

PETERS (717, **glaucoma by contusion and its treatment**) reports two cases of primary glaucoma following contusion of the globe, of which one recovered under eserine alone, the other, after treatment with eserine and paracentesis of the anterior chamber.

BELTMAN (718, **congenital teleangiectasis the cause of glaucoma simplex**) describes a case of angiectasis of the head and eyes in a girl affected with simple glaucoma. The observation of this case and a study of the literature lead to the assumption that there is a causal relationship between the vascular anomaly and the ocular affection. The increased tension had probably existed since childhood to judge by the large corneæ. Beltman assumes that the choroid of both eyes was supplied by abnormally numerous, large, and thin-walled vessels. The consequences were: (1) An unusually copious secretion of intraocular fluid; (2) excessive blood-pressure in the abnormally distended vessels; (3) diminution of resorption in case the efferent veins communicate directly with the dilated vessels. Menstruation had a decided influence on the glaucoma. This could be explained by the increase of blood-pressure during the premenstrual period.

JITTA.

ZAHN (719) found **consanguinity of the parents** in seven (9.6%) out of seventy-three cases of buphthalmus and accordingly considers himself justified in ascribing to this factor a rôle in the causation of the ocular affection.

CARBONE (720, **iridectomy in glaucoma**) propounds the theory that iridectomy in glaucoma opens a new channel for drainage of the aqueous into the veins of the choroid through the cut ends of the veins in the iris.

CIRINCIONE.

SCHMIDT-RIMPLER (721, **histologic origin of glaucomatous excavation**) examined a globe, long blind, with total cicatricial staphyloma but only moderate increase of tension. The lamina cribrosa was pushed backward and showed a large steep excavation. From the middle of the excavation a vein rose to the level of the retina. It was enclosed in connective tissue containing many nuclei. In the extrascleral part of the papilla there were two lacunæ caused by atrophy of nerve tissue. The centre of these cavities was empty. On the walls there were found highly refracting round and club-shaped formations, which were transparent and not laminated, with fibres and detritus.

XVIII.—SYMPATHETIC OPHTHALMIA.

722. LEBER, TH. **Remarks on the inflammatory agency of certain micro-organisms in the eye, with regard to the origin of sympathetic ophthalmia.** *Arch. f. Ophth.*, lviii., p. 324.

723. LINDAHL, C. **On the treatment of sympathetic ophthalmia with sodium salicylate.** *Hygiea*, 1904, II, p. 1195.

LEBER (722, **microbic origin of sympathetic ophthalmia**) shows in answer to Ulbrich (*v. Graefe's Arch.*, lviii., p. 243) that as far back as 1881 (*v. Graefe's Arch.*, xxvii., p. 331) he admitted the possibility that under some conditions the eye alone might be affected by certain micro-organisms, all other organs remaining uninvolved. Leber does not consider Ulbrich's experiments sufficient to prove that there are definite saprophytic germs which when directly introduced cause inflammation in the eye alone.

LINDAHL (723, **sodium salicylate in sympathetic ophthalmia**) reports the results of treatment in thirteen cases of sympathetic ophthalmia. Of these, seven were given large doses of soda salicylate in addition to the local therapy. Lindahl considers this drug in doses of sixty to ninety grains daily as an excellent means of combating sympathetic iritis or irido-cyclitis, being

more reliable and prompter in its action than mercurial inunction. While the use of the salicylate in traumatic irido-cyclitis will not prevent the development of sympathetic ophthalmia, the latter, should it develop, will be of a benign character. After disappearance of the inflammatory reaction under treatment with salicylates, relapses may occur. HELLGREN.

Sections XIX-XXII. Reviewed by DR. H. MEYER,
Brandenburg.

XIX.—RETINA AND FUNCTIONAL DISTURBANCES.

724. PUSEY, B. **Amyloid bodies in the normal retina.** *Klin. Monatsbl. f. Augenh.*, xlii., 2, p. 561.

725. DEUTSCHMANN, R. **Treatment of retinal detachment.** *Clin. oculist.*, July, 1904.

726. FRIDENBERG, PERCY. **Sclerosed nerve-fibres following retinal traumatism. A hitherto undescribed ophthalmoscopic picture.** *N. Y. Eye and Ear Inf. Repts.*, Jan., 1904.

727. JENNINGS, J. F. **Pigment striæ at the macula of both eyes.** *Annals of Ophthalm.*, Oct., 1904.

728. SCHMIDTHÄUSER, F. **Retinitis pigmentosa and glaucoma.** *Inaug. Diss.*, Tübingen, 1904.

729. ALT, A. **Remarks on glioma of the retina and the question of rosettes.** *Am. Jour. of Ophth.*, Sept., 1904.

730. SHOEMAKER, W. T. **Obstruction of the central retinal artery; report of a case.** *Am. Journ. Med. Sci.*, April, 1904.

731. HARMS, CL. **On blocking of the trunk of the central retinal vein.** *Klin. Monatsbl. f. Augenh.*, xliii., 2, p. 143.

732. MARIE and LÉRI. **Lesions of the retina in tabic amaurosis.** *Soc. de neurologie de Paris*, June 2, 1904.

733. CHIARINI, P. **On a case of glioma retinæ developing in the eye of a pigeon. A contribution to the study of the nature and genesis of retinal tumors.** *Boll. della R. Accad. Med. di Roma*, No. 1, 1904.

PUSEY (724, **amyloid bodies in the normal retina**) describes amyloid bodies in the otherwise normal retina of an eye enucleated for circumpapillary sarcoma. The patient was a woman of forty-two.

DEUTSCHMANN (725, **treatment of retinal detachment**) is of the opinion that the following requirements must be met in the treatment of retinal detachment, viz., removal of traction on the retina, evacuation of the subretinal fluid, and, perhaps, induction of a chorio-retinitis. For this purpose the sclera is incised at an appropriate spot with a bistoury; counter-puncture

is made at the site of detachment without injuring the conjunctiva. This may be repeated in ten days, after which the retina is often found to be reattached. In case of markedly diminished tension, the sterilized vitreous of calves may be injected.

CIRINCIONE.

FRIDENBERG (726, **traumatic sclerosed nerve-fibres**) found changes in the superficial layer of the retina, after hemorrhage or direct injury, consisting in white radiating lines as fine as hairs, which closely resembled the opaque nerve fibres of the rabbit. These striæ invariably started at the scar of a blood-clot or at the site of a foreign body. Fridenberg believes that the changes observed are due to traumatic sclerosis and opacification of the originally transparent nerve elements. Three illustrative cases are reported with fundus drawings.

ALLING.

JENNINGS (727, **pigment striæ at both maculæ**) describes a fundus in which irregularly branching lines of pigment were seen below the level of the retinal vessels. The fovea centralis was surrounded by a complete ring of pigment.

ALLING.

SCHMIDTHÄUSER (728, **retinitis pigmentosa and glaucoma**) has collected twenty cases of retinitis pigmentosa complicated by glaucoma. Of these, six were not older than forty-one, 60% males, 40% females. Of the total number of cases of retinitis pigmentosa, 2.75% were combined with glaucoma. The material did not shed light on the question of a causal connection between the two affections.

ALT (729, **retinal glioma and the rosettes**) discusses the question of the rosettes which have been found in retinal glioma. Wintersteiner claimed that these formations are proliferations of the layers of rods and cones, enclosing a lumen which is lined by a transparent membrane, the external limiting membrane, and called them neuro-epithelioma retinae. Alt states that the rosettes may have developed around a blood-vessel or lymph channel, the walls of which degenerated afterward. Numerous photomicrographs of sections illustrate the article.

SHOEMAKER (730, **obstruction of central retinal artery**) considers this case, although in a general way it showed all the signs of a so-called embolism, as one of thrombosis of the central retinal artery, as there was disturbance of circulation manifested by a weak pulse, and the patient had nephritis with undoubted changes in the walls of the blood-vessels. The

obstruction was probably located in the lower branch of the artery near the bifurcation. ALLING.

HARMS (731, **blocking of the trunk of the central retinal vein**) reports four cases of venous thrombosis with microscopic examination. The first was a case of obstruction by marantic thrombosis; the second, thrombosis just beyond a stenosis in an approximately normal lumen, which must have been produced by the formation of whirling eddies in consequence of slight disturbances in the circulation. The third case showed an obstruction due to proliferation of the intima without the medium of a secondary thrombus; the fourth case was a combined one of thrombosis on the basis of a previously existing endophlebitis.

MARIE and LÉRI (732, **retina in tabic amaurosis**) report the results of microscopic examination of eyes with tabic optic-nerve atrophy. The affection does not begin in the retina, but in the nerve, the latter showing leptomeningitis, interstitial sclerosis with endarteritis, periarteritis, and phlebitis. BERGER.

CHIARINI (733, **case of glioma retinae in a pigeon**) agrees with the view of Greeff that retinal glioma is a new growth, having its origin in embryonal cells and formed mainly of glia tissue, developing nerve cells and fibres. CIRINCIONE.

XX.—OPTIC NERVE.

734. HEINE. **Congenital optic pseudo-neuritis.** *Allg. med. Central-Ztg.*, xxix., 1904.

735. BELLINZONA, C., and TRIDONDANI, E. **Changes in the visual field during pregnancy.** *Boll. d. Soc. Med. d. Pavia*, Feb., 1903.

736. GÜNZLER, H. **Direct injury of the optic nerve by a shot across the orbit.** *Inaug. Diss.*, Tübingen, 1904.

737. GEHRUNG, T. A. **The affections of the chiasm.** *N. Y. Eye and Ear Inf. Repts.*, Jan., 1904.

738. HOFFMANN, C. **A case of indirect injury of the optic nerve.** *Inaug. Diss.*, Tübingen, 1904.

739. MANN, L. **Attempts at electro-therapeutics in diseases of the optic nerve.** *Zeitschr. f. diät. und phys. Therap.*, viii., p. 416.

740. SCHMIDT-RIMPLER. **Tumor of the optic nerve operated by Krönlein's method.** *Ophth. Klinik*, No. 1, 1904.

HEINE (734, **congenital optic pseudo-neuritis**) presented a number of patients with typical congenital optic pseudo-neuritis, and shows the difficulties of distinguishing them from pathological conditions.

BELLINZONA and TRIDONDANI (735, **field of vision limited in pregnancy**) found in 24 healthy pregnant women a limitation of the visual field, consisting in a slight bilateral nasal hemianopsia. The limitation is almost constantly more marked in the left eye, and the condition particularly pronounced in primiparas, increasing with the advance of pregnancy. Vision is not affected; the contraction is uniform for the various color fields.

CIRINCIONE.

GÜNZLER (736, **optic nerve injured by shot across the orbit**) reports 6 cases of gunshot wound of the optic nerve observed in the Tübingen clinic, and reviews 16 others hitherto published. He lays stress on the difficulty of accurately determining the path of the bullet, and gives, as characteristic symptoms, limitation of motility without injury of the globe, exophthalmos, moderate mydriasis with loss of direct, but preservation of consensual pupillary reaction, blurring of the outline of the disk, copious hemorrhages in the vicinity of the nerve-head, and later the ophthalmoscopic picture of rupture of the choroid.

GEHRUNG (737, **the affections of the chiasm**) gives an interesting résumé of 102 published cases of affections of the chiasm. Among the commoner ætiologic factors are acromegaly, syphilis, tuberculosis, carcinoma, fibroma, aneurysm, cysts, and fracture of the base of the skull. The diagnosis was confirmed by autopsy in 59 cases. The fact that the causal diseases are of such a varying nature leads to the conclusion that lesions in this region are either very rare or are not generally recognized.

ALLING.

MANN (739, **electro-therapeutics in optic-nerve diseases**) has made use of the recently established fact that currents of much higher intensity than were formerly used in neurotherapy are well borne. His experiments on the optic nerve were made with currents of from 30 to 100 milliampères, and seem to show that repeated irritations affect the electro-chemical structure of nerve tissue physically, just as they act on chemical combinations. Improvement of vision and slight increase in the limits of the visual field were obtained in a number of cases. Color perception was improved.

SCHMIDT-RIMPLER (740, **tumor of optic nerve operated by Krönlein's method**) reports a case of myxosarcoma successfully removed by the Krönlein operation. The question of

pupillary reaction after resection of the optic nerve was touched upon in the discussion following the demonstration of the patient.

XXI.—INJURIES, FOREIGN BODIES, PARASITES.

741. MOBILIO, G. **Prognosis and treatment of shot-wounds of the eye.** *Arch. di Ottalm.*, No. 3-4, 1904.

742. WICHERKIEWICZ. **Migration of foreign bodies in the eye.** *Klin. Monatsbl. f. Augenheilk.*, xlii., 2, p. 559.

743. PURTSCHER, O. **The prognosis of contusions of the eye, with particular regard to injury by goring.** *Beitr. z. Augenh. u. Festschr. f. Hirschberg*, 1905.

744. PASCALE-ALBERTO. **Transitory amaurosis from detonation of firearms.** *Boll. d'oculist.*, No. 15, 1904.

745. NUËL. **On sympathetic amblyopia.** *Policl. de Brux.*, 1904.

746. CARBONE, A. **On the importance of early interference in intra-ocular cysticercus and the prognostic significance of tension. Two illustrative cases.** *Clin. oculist.*, May-June, 1904.

MOBILIO (741, **prognosis and treatment of shot-wounds**) advises enucleation in all cases in which ciliary inflammation persists, and the shot can not be seen, as well as when there is danger of panophthalmitis. The globe can be preserved if the inflammation has subsided spontaneously or after removal of the pellet.

CIRINCIONE.

WICHERKIEWICZ (742, **migration of foreign bodies in the eye**) reports a case in which a grain of shot, which had been in the eye for a long time, appeared below the point of entrance, 6mm distant from the cornea, and was removed.

PURTSCHER (743, **prognosis of contusion of the eye**) gives the histories of sixty-two scleral ruptures following contusion, of which twenty-six were due to thrust with a horn. Leaving out of account the cases due to excessive traumatism in which extensive destruction and hemorrhage necessitate prompt enucleation, it appears that open wounds of the sclera due to bursting offer a relatively favorable prognosis, particularly the subconjunctival ruptures. A lens subconjunctivally dislocated into the wound should be removed to avoid endogenous infection. Typical scleral rupture running parallel to the canal of Schlemm is less serious than one in the ciliary region. In every case of bursting of the coats of the globe, particular attention should be paid to possible sources of endogenous infection, especially to any nasal disease.

PASCALE-ALBERTO (744, **transitory amaurosis from de-**

tonation of fire-arms) concludes, from a case in his own practice and from other communications, that the transitory amaurosis which may follow loud and repeated reports of firearms occurs in individuals predisposed to glaucoma, producing an irritation of the retina which causes temporary blindness.

CIRINCIONE.

NUËL (745, **sympathetic amblyopia**) has seen twenty-two cases of the sympathetic ophthalmia originally described by him (*Arch. d'ophthalm.*) in 1897. This form may appear months or years after the original injury, beginning with headache, photophobia, slight diminution of vision, and contraction of the visual field, with normal fundus. After some variations, vision becomes markedly worse, the field greatly contracted, the blind spot enlarged, and the disk pallid. The condition is of great forensic importance, as the early symptoms may be taken for evidence of simulation. Even in case of but slightly diminished vision the laborer's efficiency is much affected or destroyed. Complete recovery can be expected only at an early stage. It was seen by Nuël in only three cases.

BERGER.

CARBONE (746, **importance of early interference in cysticercus**) obtained a good functional result after removal of the parasite in a case of endobulbar cysticercus without irido-cyclitis and diminished tension. In another case operation was not performed until after chronic irido-cyclitis with minus tension had developed, and vision became worse.

CIRINCIONE.

XXII.—OCULAR DISTURBANCES IN GENERAL DISEASE.

747. NICODEMI, C. **Clinical notes on coloboma of the fundus oculi.** *Ann. di Ottalm.*, viii., 1904.

748. BICHELOU, H. **A study of infectious optic neuritis.** *Ann. d'oculist.*, cxxxii., p. 352.

749. ORLANDINI, O. **Affections of the optic nerve and retina due to changes in the circulatory apparatus.** *Ann. di Ottalm.*, viii., 1904.

750. STIRLING, J. W. **Bilateral amaurosis following severe hemorrhage after extraction of a tooth.** *Ophth. Review*, Aug., 1904.

751. AHLSTRÖM, G. **Some complications of herpes zoster ophthalmicus.** *Hygiea*, 1904, ii., p. 920.

752. DE LIETO VOLLARO. **Changes in the optic nerve and its sheaths in purulent cerebro-spinal meningitis.** *Arch. di Ottalm.*, ii., 1904.

753. JAMESON, T. H. **Transitory monocular blindness.** *Ophth. Record*, June, 1904.

754. EVANS, J. J. The eye symptoms of traumatic hysteria. *Birmingham. Med. Review*, Sept., 1904.

755. GOULD, G. M. Non-operative treatment of eye-strain with regard to a possible cure of epilepsy, etc. *Am. Medicine*, April 8, 1904.

756. TATY and GIRAUD. Lesions of the cerebral and cerebellar cortex in a congenitally blind idiot. *Congrès d. méd. alien.*, Pau, Aug. 1904.

757. ACHARD and PAISSEAU. Meningeal hemorrhage with convulsions, followed by paralysis of the third pair. *Soc. méd. d. hôp. de Paris*, April 29, 1904.

758. M'GILLIVRAY, A. Quinine amaurosis with notes of a case. *Scottish Med. and Surg. Journ.*, Nov., 1904.

759. WIDMARK, J. Toxic amblyopia ending in complete blindness. *Svensk. Läkares. Förh. Hygeia*, 1904, ii., p. 225.

NICODEMI (747, notes of coloboma of the fundus oculi) considers colobomata of the fundus oculi as injuries due to inflammatory processes. The latter, in the form of sclero-chorio-retinitis, appear during and after the closure of the embryonal ocular cleft and not only in case of developmental arrest. Syphilis, in the first and second generation, is frequently the determining cause of coloboma as well as of other congenital anomalies, acting not only as an infection but as a disturbance of nutrition predisposing to secondary infection in the deeper coats of the eye.

CIRINCIONE.

BICHELONNE (748, infectious optic neuritis) reports the case of a man of twenty-two in whom an acute catarrhal angina was followed by double optic neuritis, with amaurosis, lasting for six months, and leading, in one and one-half months more, to complete recovery. Only four similar cases are on record.

BERGER.

ORLANDINI (749, affections of optic nerve and retina from changes in the circulatory apparatus) considers that affections of the optic nerve and retina occurring in the course of cardiac or renal disease are due not alone to simple stasis, but to an inflammatory process of toxic origin due to retention in the blood of toxic products of metabolism.

CIRINCIONE.

STIRLING'S (750, bilateral amaurosis from severe hemorrhage after extraction of a tooth) case was that of a boy of six of anæmic appearance. Two years before, the extraction of a tooth had been followed by a copious hemorrhage which lasted for three or four days, and nearly was fatal. On recovering consciousness, vision was completely lost, but partially returned

within two weeks, and had since remained unchanged. After a slight injury to the head, severe bleeding again took place. The patient was evidently a hæmophylia. Vision was reduced to counting fingers at six inches. The visual fields were reduced to 15° or 20° . There was no color perception. The pupils were dilated and scarcely reacted. Both disks were white and showed traces of post-neuritic atrophy. DEVEREUX MARSHALL.

AHLSTRÖM (751, **complications of herpes zoster ophthalmicus**) reports the case of a man of fifty in whom herpes zoster of the first branch of the trigeminus was associated with parenchymatous keratitis. In two patients with affection of the frontal branches, herpes vesicles appeared on the cornea, although the naso-ciliary branch was not involved. This unusual complication could be explained by the existence of two separate foci of disease. This hypothesis appears well founded in consideration of the case of a man of forty with a typical eruption of vesicles on the cornea without any skin eruption in the region of the trigeminus, but with intense "shingles" over the lumbar plexus of the corresponding side. In another case, that of a man of sixty, frontal herpes was associated with optic neuritis of the same side. HELLGREN.

DE LIETO VOLLARO (752, **changes in the optic nerve and its sheaths in purulent cerebro-spinal meningitis**) found, on microscopical examination of five cases of purulent meningitis, marked perineuritic and interstitial infiltration of the optic nerve in the bony canal, which explained the occurrence of bilateral blindness without ophthalmoscopic changes. CIRINCIONE.

JAMESON (753, **transitory monocular blindness**) reports the case of a man of eighty-four, who suffered from attacks of complete blindness, lasting five minutes. The first examination was completely negative. A few days later, during ophthalmoscopic examination, the retinal arteries and veins were threadlike, and the eyes became blind. After two minutes the circulation was restored. The disturbance was attributed to degenerative changes in the blood-vessels. ALLING.

EVANS (754, **the eye symptoms of traumatic hysteria**) reports two cases to show the difficulty of deciding whether ocular affections are organic or functional, and notes that men as well as women may be affected by traumatic hysteria. A factory girl of twenty-three had been struck on the right eye in January,

1900. The injury was a trivial one and must have been cured in a few days. On February 14th she reappeared with conjunctival injection, photophobia, and lachrymation, with tonic blepharospasm. The pupils were normal. There was no actual neuritis. The visual fields were contracted. Atropine, bromides, and galvanism were employed. In spite of treatment there were repeated relapses during the next two years, associated with various other hysterical manifestations.

The second case was that of a twenty-seven-year-old quarry-workman who was struck by a piece of rock on the external angular process. He was treated for a short time, and returned, ten months later, complaining of severe pain in the eye, and requesting enucleation. There was slight injection and no vision. The other eye could count fingers only, and had a contracted visual field. The patient did not return. In these cases there is always limitation of the fields both for white and for colors. The prognosis is bad and treatment of no avail. Hypnotic suggestion was used without effect. DEVEREUX MARSHALL.

GOULD (755, **improvement in epileptics without operations**) claims that in three months nine out of fifty-seven patients showed a decrease in their 382 attacks of epilepsy, and advises the appointment of a resident ophthalmologist in all institutions like the Craig Colony. ALLING.

TATY and GIRAUD (756, **brain of a blind 14-year-old girl showed absence of ganglion cells in the calcarine cortex**) describes the microscopic changes in the brain of a fourteen-year-old girl, born blind. Complete absence of ganglion cells was found in the calcarine fissure only, in accordance with Henschen's observations, but partial disappearance was noted in the cortex of the frontal and occipital lobes, as well as in that of the cerebellum, particularly the flocculus. The last observation confirms Dor's experiments on rabbits, in which similar changes were found after enucleation of an eye. BERGER.

ACHARD and PAISSEAU (757, **meningeal hemorrhage with convulsions and oculomotor paralysis**) observed in a young man of eighteen a sudden attack of meningeal irritation, epileptiform convulsions, and somnolence, followed in the course of several days by incomplete oculomotor palsy. Repeated lumbar puncture showed the existence of a meningeal hemorrhage. The

general symptoms as well as the local paralysis could best be explained by the sudden increase of intracranial pressure.

BERGER.

M'GILLIVRAY (758, **case of quinine amaurosis**) treated a tea-planter, aged fifty-four, from Ceylon, who had had quinine amaurosis for four years. The patient was a heavy drinker but did not use tobacco. After a long and arduous journey, he had arrived in a state of exhaustion at an inn. The landlord, thinking the man had a fever, gave him a heaped dessert-spoonful of quinine and put him to bed. After a sound sleep, the patient awoke on the following afternoon, to find himself absolutely blind. After three days he was able to distinguish light and dark, and by the eighth could read a letter he had previously written. Central vision gradually improved, but peripheral sight did not return, so that he was apt to stumble over objects unless he looked directly at them. V now $\frac{5}{8}$; Jäg. No. 1. The fields are contracted, particularly above and below. Color perception and light sense are normal. M'Gillivray then discusses the whole clinical picture of quinine amaurosis.

DEVEREUX MARSHALL.

WIDMARK (759, **a typical and severe case of toxic amaurosis**) reports the case of a stone-mason of thirty-nine who had consumed a Swedish pound of black chewing tobacco fortnightly since his fifteenth year. In 1902, lightning struck near him, daz-zling him for some time, but causing no injury whatsoever. Vision, which until this time had been good, now began to deteriorate rather rapidly. A month later he was unable to read, and after another month he even had trouble in finding his way about. On admission, less than three months after the first appearance of ocular symptoms, he was able to count fingers with the right eye at about 3 feet and with the left eye at $1\frac{1}{2}$ feet. There was pallor of the temporal half of both disks. Examination of the field of vision showed changes which indicated an advanced stage and marked degree of toxic amblyopia. During a month's treatment in the clinic, the patient's condition improved, both in regard to the field of vision and as to sharpness of sight, but after his discharge from the hospital vision immediately began to deteriorate. Three months later the patient was completely blind and the entire disk was atrophic.

HELLGREN.

Obituary.

SWAN M. BURNETT.

At the regular meeting of the Society of Ophthalmologists and Otologists of Washington, D. C., held January 19, 1906, the following preamble and resolutions were adopted:

WHEREAS, The Society of Ophthalmologists and Otologists of Washington, D. C., has learned with keen regret of the death of Dr. SWAN M. BURNETT, which occurred at his residence in this city January 18, 1906, therefore be it

Resolved, That in the death of its first President and one of its chief organizers, we feel that this Society has lost one of its most valuable and highly esteemed members, and that the profession in this country and in the world at large has lost a distinguished scientist and teacher.

Resolved, That the Society wishes to express its deep sorrow at his death, and to extend its sympathy to his widow and son in their affliction.

Resolved, That a copy of these resolutions be spread on the minutes of the Society, and that a copy of the same be sent to the family and to the ARCHIVES OF OPHTHALMOLOGY.

Resolved, That the Society adjourn as a further mark of respect to his memory.

[Signed]

W. H. FOX,
E. O. BELT,
W. P. MALONE,
Committee.

ARCHIVES OF OPHTHALMOLOGY.

THE KNIFE-NEEDLE OPERATION FOR SECOND-ARY CAPSULAR CATARACT.*

BY EDWARD JACKSON, M.D., DENVER.

(With three text-figures.)

IN most of our text-books on diseases of the eye, the short paragraph devoted to the needle operation for secondary cataract contrasts sharply with the pages given to the description of cataract extraction. Yet it is safe to say that in practice there are ten failures of the needle operation to one failure in extraction. These failures are well illustrated by the following case seen recently.

Mrs. H., aged seventy-four, came with a history of cataract extraction from the left eye one year before, by an ophthalmic surgeon of ability and considerable operative experience. Six months after, the eye was needled, and the needling operation repeated three months later. Immediately after the needling, vision was improved, but in a few days was as bad as ever. Vision with lenses was $\frac{4}{5}$ partly. But the patient had not enough confidence in her vision to go about alone, regarded the operation on her left eye as a failure, and came for an operation on her right eye. The eye showed the results of extraction with an iridectomy, the pupil being occupied by wrinkled capsule, some portions of it moderately thickened. The pupillary membrane had been punctured and partly loosened at its nasal margin, but no clear pupil had been secured.

An operation with a knife-needle, which was not difficult although slightly complicated by the loosening of the membrane from its attachments at the nasal side, gave a clear

* Read before the Colorado Ophthalmological Society, Dec., 1905.

pupil and vision of $\frac{4}{5}$, which remains unchanged at the end of six months.

Cases in which success is not attained, or is only attained after repeated needle operations, are quite common. E. J. Loring,¹ in proposing a new procedure, said: "It is to avoid these numerous and, as a usual thing, inefficient operations." F. Buller,² in suggesting another method, remarked: "Dissection of the capsule for the betterment of vision, after otherwise successful cataract operations, presents so many difficulties and dangers that any genuine improvement in the technique of removing or displacing an obstructing capsule cannot fail to be appreciated."

I was once taken to task by Dr. H. Knapp for the statement³ with regard to operations for secondary cataract: "They are not without danger. They may cause infection of the eye and general inflammation of the uveal tract." This was contrary to his experience, and I had to admit that it was not supported by my own. But a text-book should rather reflect the general experience of the profession. I have repeatedly seen eyes lost after needling in the practice of others, and there is abundant literature to justify the above statement.

Dr. J. E. Weeks,⁴ in a paper advocating a special form of knife-needle operation, said: "The reluctance of many operators to perform dissection is undoubtedly due to some bad results that have followed." And in discussion of Dr. Weeks's paper, Dr. Cheatham narrated an experience which, he said, "makes me dread the operation, and I never do it if I can avoid." Dr. H. D. Noyes found that "in the simple operation, where the pupil has not been interfered with, to deal with the membrane is not a simple thing." Elsewhere⁵ Dr. Noyes said: "Under all precautions, both operative and antiseptic, I have seen disastrous accidents follow a faultless dissection."

In the Royal London Ophthalmic Hospital Reports,⁶ C. D. Marshall reports the results of 1509 cataract extractions. Suppuration occurred in 1.72 % of the cases. Five hundred and twelve had secondary operations, and after having escaped suppuration in the primary operation 1.02 % were lost

by suppuration in the secondary operation, while 5.58% underwent slow inflammatory changes, which ultimately diminished or permanently destroyed the sight. In the same reports two years later, Fischer and Marshall' report that, among one hundred and twenty-three eyes subjected to simple needlings for lamellar cataract, eight were lost by suppuration, and five of these were enucleated.

However, I fully believe with Dr. Knapp⁸ that with proper precautions such unfavorable results may almost always be prevented, and that the needle operation for secondary cataract may be made as safe and reliable as any operation in surgery. For its proper performance the following points must be carefully attended to:

(1) *To see the operation, there must be a strong oblique illumination of the eye, and the surgeon must possess powerful accommodation, or use spectacles with strong convex lenses, or the binocular magnifier.* The reflex from the cornea when the eye is exposed to a general illumination will effectually baffle any effort of the surgeon to see what he is doing to the pupillary membrane. Even though, to start with, the eye be placed so that the reflex does not prevent seeing the membrane, a slight movement of the eye, or the distortion of the cornea caused by the needle passing through it, may bring the reflex in the way, so that it hides the whole field of operation. The only light that can be fully depended upon is that of focal illumination in the dark room.

The thickened bands of capsule and synechiæ that are to be considered in doing such an operation, and the exact placing of the point of the knife for the incision, are matters of too minute distances to be readily seen from a working distance of twelve or fourteen inches. From this distance, too, it may be quite impossible to judge whether or not one has accomplished what he desires. The operation becomes far simpler and more certain, when the eye is viewed under the amplification obtained at a distance of three or four inches. This may be secured by the exertion of exceptionally powerful accommodation, and the wearing of the necessary convex lenses, but only by bringing the surgeon's face inconveniently near the patient's eye. It is much more convenient

to work with the binocular magnifier, planned to give a working distance of six inches, while the eye is seen through three-inch lenses, in full binocular vision.

(2) *The knife-needle must be perfectly sharp, and its shank must exactly fill the external opening to prevent escape of aqueous.* There are very few membranes so tough that they cannot be cut by the gentle sawing movement of a sharp knife-edge, without dangerous traction on their attachments. In the old needle operation for secondary cataract, no attempt was made to cut the membrane. It was simply torn. Mackenzie⁹ says: "We often find that the shreds into which we tear the obstructing membrane retreat behind the iris." It is probable that this tearing of the membrane, and consequent dragging upon its attachments, was responsible for a large proportion of the bad results obtained by old needle operations. Bowman's double-needle operation was superior to its predecessors, because while it tore the membrane it did so without dragging on its attachments. Bulter's double needle to fix the membrane,¹⁰ Agnew's and Noyes's plans to operate so as to drag on its centre rather than upon its attachments, were all improvements, in that they diminished the risks of this dragging. But Hays's use of a knife-needle was a greater advance. Even the employment of a Graefe knife, or a smaller knife of similar pattern, as by Loring and Berry,¹¹ were improvements over the tearing operation. Only a cutting, not a tearing, operation should now be considered. Knapp¹² has insisted on this, and probably to his practice in this respect is largely due the absence of bad results from the needle operations in his very extended experience. But traditions and descriptions of the old tearing operation still influence the profession, so that we are not so careful as we might be about the sharpness of the cutting edge of the needle, and to see that the force is exerted exactly in the direction of the cutting edge. If the cutting edge be not turned exactly in the direction in which the force is applied, one tears with a sharp needle as well as with a blunt one. The escape of aqueous from the corneal wound alongside of the needle always adds to the difficulty and uncertainty of the operation. This is a matter of

such common observation that it need not be dwelt on here.

(3) *The knife-needle must be entered through the vascular tissue of the corneal limbus, and not through the clear cornea.* This is the essential and especial point that I wish to emphasize. It is surprising that it has so long escaped special attention. It was emphasized in a paper read before the Section on Ophthalmology of the Philadelphia College of Physicians more than eight years ago.¹³ A few writers have spoken of making the puncture "near the corneal margin."¹⁴ But the majority only describe something like the operation given by Fuchs,¹⁵ who says: "The puncture is made in the centre of the outer and lower quadrant of the cornea, as in the dissection of soft cataracts." For special reasons it may be allowable to make the puncture at this point, in the first dissection of a soft cataract. In my judgment, it is wrong ever to enter the needle through the clear cornea in operating for secondary capsular cataract. I believe that in time it will clearly be ranked as malpractice to do so.

The entrance through the limbus gives two immense advantages: practical immunity from infection by going through a vascular tissue, and a longer leverage. The point of entrance through the sclero-corneal coat becomes the fulcrum about which all subsequent movements of the knife-needle take place. If this be well in the vascular limbus it will, on the average, be twice as far from the point at which the membrane is being divided by the knife-edge, as would a puncture in the cornea as advised by Fuchs. This means that the same length of sweep of the knife-edge will be obtained with one-half of the twisting of the shank in the puncture—less than one-half of damage to adjoining tissues.

In the vascular limbus the wound is instantly closed with fresh blood, the best antiseptic we have at our command in ophthalmic operations; and healing by primary union is certain. I have never seen the slightest evidence of infection of such a wound, and it is hard to conceive how such infection could occur in a carefully performed operation. In the practice of a colleague I have seen infection appear in a corneal wound, at the end of a week of apparently perfectly

favorable progress, and go on to rapid disorganization of the eyeball. In the case of corneal puncture the greater bruising due to a short leverage falls on a non-vascular tissue, exposed in the conjunctival sac, which can never be rendered sterile. Such an operation needlessly and recklessly violates important surgical principles.

The corneal puncture also entails a very strong probability that the operation will prove ineffective. It has been mentioned that to puncture the limbus doubles the length of leverage and the sweep of the knife-edge. But it far more than doubles the length of the incision that may be obtained by a sweep of the needle. The pupillary membranes operated on are all of them elastic. Mackenzie, speaking of the opaque and thickened capsule, says: "In this state it is so tough and elastic that we cannot divide it. We may carry it on the point of the needle almost to the bottom of the vitreous humor, whence it instantly springs up again to its former situation."

Even with a perfectly sharp knife the membrane always stretches and gives somewhat, before the knife-edge begins to cut. Suppose in a given case one can obtain with a peripheral puncture a sweep of 8mm, while with the corneal puncture he can get only a sweep of 4mm. If now the membrane pulls 3mm before the edge of the knife, as it will in the majority of cases, before the knife begins to cut, the opening obtained with the corneal puncture will be but 1mm, while that secured by entering through the limbus will be five times as long. But the difference between the two plans of entrance is even greater than this would seem to indicate. In the ideal operation, no aqueous escapes until the operation is completed. But even with a well-proportioned knife-needle, under the pressure to which the eye is necessarily subjected and the twisting movements, especially in the rigid tissue of the cornea, some aqueous is very frequently lost. When such a loss occurs, if the needle enters through the cornea approximately perpendicular to the pupillary membrane, it is very easy for this membrane to be pushed up the needle until it is almost in contact with the cornea, and no amount of sweeping or twisting will cut the

membrane at all. This is the common cause for failure of the second incision that we attempt to make in the capsule. When, however, the needle is entered through the limbus, its position is so oblique to the plane of the membrane that it is impossible for the puncture in the membrane to be pushed up to the puncture in the limbus so as to prevent an effective incision.

This superiority in efficiency makes it easy to attain success with the limbus puncture in cases in which it would be quite useless to attempt a simple needling by the ordinary method. Not all cases of capsular cataract can be relieved by such needle operations. But in more than ten years I have encountered no such case that I could not relieve by a single needle operation through the limbus. And in that time I have relieved several that in earlier years I would have subjected to some more formidable operation, such as excision of the membrane with the de Wecker scissors, or iridectomy. A case in point is the following, in which the only criticism that could be offered upon the result was that the opening obtained by the single needle operation was larger than necessary.

Mrs. B., aged seventy-one, after extraction without iridectomy suffered prolonged irido-cyclitis. At the end of ten weeks the eye was quiet, tension normal, light perception good, but the pupil was reduced to a line and filled with thick exudate. With the large Knapp knife-needle entered through the lower-outer part of the limbus, a cut was made in the direction of the pupil, and a second incision, at right angles thereto, across the iris sphincter.

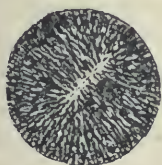


FIG. 1.—Pupil closed by prolonged plastic uveitis.

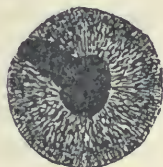


FIG. 2.—Pupil obtained by a single needle operation.

This operation was followed by a moderate recurrence of the uveitis, but there was no tendency to reclosure of the pupil, and with correcting lenses vision of $\frac{4}{5}$ was subsequently secured. The appearances of the iris and pupil before and after the needle operation are shown in the accompanying figures.

The objections which might be, or have been urged to entering the eye through the limbus are: nearness of the puncture to the ciliary body, greater difficulty in cutting a membrane obliquely, and greater difficulty in exactly placing the point of puncture.

The fear of approaching the ciliary body is based on failure to appreciate the distance of the limbus in front of the dangerous zone. It is only needful that the superficial tissue at the point of entrance shall be vascular, and the needle can be entered through the vascular tissue so as to pass 2 or 3mm distant from the nearest point of the ciliary body. In passing through the limbus, the danger of involvement of the ciliary region is not materially greater than for any puncture placed in the clear cornea.

The supposed greater difficulty of cutting the membrane because of the obliquity of the knife to it, does not exist. Nothing of the kind has been felt in practice; and as a matter of fact the membrane pushed before the point or edge of the knife in a measure folds over it, so that the cut is made about perpendicular to the membrane. The difficulty of exactly placing the point of puncture with the needle oblique to the membrane is real, but it is comparatively slight and of no practical importance. The securing of a sufficient opening in the membrane is much more important than the exact placing of it. But with the binocular magnifier there is little difficulty in placing the puncture and cut where they are wanted.

(4) *Placing of the Incisions in the Membrane.*—A single straight incision is never reliable. However it may gap at the time of operation, it tends subsequently to close. A second incision, meeting the first at an angle, will prevent this. A crucial incision would often be good; but it is equally effective and decidedly easier to make T-shaped or V-shaped incisions. Such incisions are illustrated in the figure on page 135, which shows by the solid line the first incision just being completed, and by the broken line the place for the second incision. The incision which is nearer to the point of entrance through the limbus should be made first, because it is the more difficult. Great care must be taken

to see that the second incision passes fairly into the first, and does not leave a bridge of membrane between them.

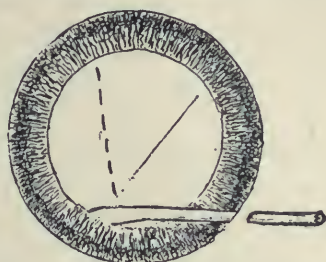


FIG. 3.—Position of incisions in the pupillary membrane.

The specific gravity of the membrane is so nearly that of the aqueous humor that the fragments of membrane float up or down equally well. It is therefore of little importance whether the junction of the two incisions is upward or downward, or to one side. In planning them it is wise to make the first incision pass through or near the firmest adhesions of the capsule to the iris. Sometimes the second incision can be better made by withdrawing the knife-needle and entering it through some other part of the limbus. Knapp¹⁹ speaks of having made such repeated punctures without any ill effect. With the entrance through the limbus made obliquely with a Knapp knife-needle, I have found no difficulty from leaking through the first puncture, while the second incision was being made. Eyes subjected to two punctures through the limbus certainly heal more smoothly and promptly than they do after a single puncture through the cornea, subjected to the necessary greater twisting.

Summary.—The most important points here urged are: The knife-needle should always be entered through the vascular tissue of the limbus. It should be absolutely sharp, and used so as to cut, not tear. The operation should be done under strong illumination. Two incisions must be made, completely joining each other at a sufficient angle. Attention to these points will render the operation with the single knife-needle efficient for almost all cases of secondary capsular cataract, and make it one of the safest operations of surgery.

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THE TREATMENT OF AFTER-CATARACT.

BY MAJOR HENRY SMITH, I. M. S.,

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THIS is one of the evergreens of ophthalmic surgery, Every one admits that, however successfully a cataract may be extracted by the orthodox method by which the capsule is left behind, there is an after-cataract—an opaque capsule varying only in degree of density—and that if the patient is to have vision for fine work an after-cataract operation is invariably necessary.

It is a fact, I think, which most men of experience will admit, that the treatment of an after-cataract by needling is more difficult to the operator and more dangerous to the eye than an ordinary cataract extraction. In my observation, an eye containing an after-cataract, whether it be dense or a mere capsule, is always a source of danger to its possessor. An after-cataract or capsule has no function in nature to perform and nature resents its presence. It is, in a manner, a foreign body and nature behaves to it as she behaves to such foreign bodies.

Ask any patient who has an after-cataract if he feels that he has got an eye, and, I think, he will almost invariably tell you that he does. He will tell you that if exposed to cold wind—if he coughs or sneezes or strains at stool—he feels that eye tender. My observation is, that if he gets a mild ophthalmia in it or the slightest injury he is very likely to have serious intraocular inflammation of almost any variety. These conditions are not invariable but are exceedingly common.

It is interesting to look over the discussion on the treat-

ment of after-cataract at the meeting of the British Medical Association at Cheltenham in 1901, when it was laid down and tacitly admitted that "the ideal extraction of a cataract is that of the whole lenticular body in its capsule, but that this is only safe under exceptional circumstances." Then to observe the reception I got at the British Medical Association meeting at Swansea in 1903 when I appeared to demonstrate that it was not only ideal in theory but ideal in practice and that the exceptions to this were few. The President of the Section called for criticisms and opinions by saying that he "felt that there was a deep-rooted opposition to this procedure in the meeting." And when done not a word of complaint from the President of the Section. Matters in this respect might have been different if I had been Herr von Teufel from the Vaterland instead of being an executive officer of the Indian Medical Service. Similar was the reception Keegan and Freyer got when they first brought litholapaxy prominently before the profession. Then to note in connection with the above mentioned admission at Cheltenham in 1901, the fact that extraction in the capsule had been prominently brought forward at Swansea in 1903, and the fact that at the recent British Medical Association meeting and at the recent meeting of the American Medical Association not a single reference was made to extraction in the capsule though, at both those meetings, the subject was discussed at length of what is, practically speaking, *the best way of preventing after-cataract complications*. Why do ophthalmologists thus stand off extraction of cataract in the capsule as unmentionable—as a "leper"? I can only say that, in my opinion, the day is not far distant when they will have to get into closer quarters with it. The attitude of ophthalmologists towards extraction of cataract in the capsule is, I think, correctly represented on page 1419 of the *British Medical Journal* of November 25, 1905.

We now come to the orthodox operation of needling after-cataract. Will those who are afraid of injuring the vitreous by extracting cataract in the capsule attempt to persuade us that they can needle an after-cataract without tearing up the vitreous with their needles? Needling is a

haphazard operation largely in the dark as no man can see how far his needles enter the vitreous. If needling is to be done efficiently, the operator must make sure that his needles are well through the after-cataract. If not well through it, he will fail to needle efficiently and will be obliged to make one or more successful attempts with several days intervening. Needling after-cataract is a survival of the practices of the days before antiseptic surgery. It is closely allied, in its whole rationale, to the immemorial operation of couching the lens. The lens-coucher attempts to couch the whole lens. The modern procedure is to extract the contents of the capsule or as much of the contents as the operator can, and, later on, to couch the capsule or tear it up with what may remain of its contents without making more than needle punctures into the anterior chamber.

We have only to look over the discussion at the British Medical Association meeting of 1901 to see that the multiplicity of procedures for what seems a simple operation brought forward by the leading men, each so satisfactory to its author, is in itself evidence that none of them is satisfactory.

With after-cataract the procedure which I adopt and of which I am a firmly convinced advocate is: dilate the pupil with atropine, cocainize the eye, make an iridectomy-sized wound at the sclero-corneal junction above, do an iridectomy if it has not already been done; reach in an ordinary iris forceps, a little stouter than usual, somewhat beyond the centre of the pupil, and allow the blades to open wide, and drive the point, through the after-cataract wide apart, close the forceps tight, and fetch out the offending body. Thus treated the capsule generally comes out in its entirety, and if not in its entirety it comes out with more efficiency than is to be had by any needling. There may be an escape of a bead of vitreous which is of no importance. Escape of vitreous should not occur if an assistant keeps the upper lid lifted well forward with a blunt hook and keeps the lower lid well drawn down by placing his thumb on the face below it. In this procedure the object of removing the offending body is generally accomplished, and every step of the

operation can be properly seen by the operator, and he knows exactly what he is doing. The results are eminently satisfactory.

ON THE ETIOLOGY OF LAMELLAR CATARACT.¹

By H. KNAPP.

IN the third decade of the 19th century William Mackenzie, of Glasgow, described a peculiar kind of cataract, which he mostly found in young people, and from its aspect called zonular. He thought that a plate-like stratum was the periphery of the cataractous lens, the latter being shrunken so that a transparent band encircled the cataract and enabled the patient to see through it. After the invention of the eye mirror and the examination by oblique light were introduced, Edward Jäger, of Vienna, discovered that the shrinkage of the lens of Mackenzie was only an opaque layer between the transparent centre and the likewise transparent peripheric layer. He gave it the proper name, fascicular cataract (*Schichtstaar*), also lamellar or perinuclear cataract. The anatomy of this singular gray sheet was soon understood, but its origin is still to-day an object of research. Soon it was noticed that it was a disease of childhood, and that the children so affected suffered from rickets and convulsions. These two symptoms were the basis in the search of the etiology. Is it the convulsions or a disturbance of nutrition that produces this particular layer between the nucleus and the mantle of the growing lens?

Lamellar cataracts are rarely congenital; the greater number is seen in early childhood.

We can confidently assert that lamellar cataract is an ocular manifestation of rachitis, like the degeneration of the teeth. The latter consists in a porosity or defective

¹ Read before the Section of Ophthalmology of the New York Medical Academy, December 18, 1905.

development of the enamel (erosion). The cause of these changes is a lack of lime to build up the enamel, and the result is a defective product of amorphous masses. The large misshapen skull of these children, with their periodic exacerbations of serous meningitis, causes convulsions, in ninety per cent. of lamellar cataract. Now, what is the cause of the lamellar cataract?

Peters, the former assistant of *Saemisch*, thinks that the convulsions included also the inner muscles of the eye, chiefly the ciliary muscle, which by its spasmodic contraction interfered with the lens.

Peters, *Zirm*, and others call it tetany, and lay the greatest stress on this symptom.

Horner affirms that the convulsions were a consequence of the craniotabes of the rachitic children, and that the craniotabes extends its influence not only on the bones but also the epithelial structures; therefore "bone and lens." One of the authors on this subject says: "If a competent ophthalmologist examines these eyes during the period of development of the perinuclear cataract, he may come nearest to the solution of this question." I have, in my long life, seen and treated a fair number of zonular cataracts, but there was only one patient that seemed to possess the most important symptoms for clearing up this question. Permit me to read her history, copied from my (private) record-books.

Charles G. B.'s daughter *Rozelia*, of Syracuse, New York, two years and two months old, was brought to me December 1, 1896. Hydrocephalic conformation of forehead; occiput large when born. Lens transparent; media ophthalmoscopically appear clearly red. Details of fundus not recognizable; place of optic disks apparently an indistinct, whitish patch; no blood-vessels to be made out.

When she was SEVEN MONTHS old, she had a slight convulsion. Then she "got a cold," and the eye-ball was red, and "running matter." The child follows objects, grasps them correctly; eyes move well. The disease lasted six weeks.

Dr. M. ALLEN STARR, who was consulted, writes "that the child probably has had acute inflammation of the ependyma

of the ventricles, with effusion at the time, but that the process was now arrested, and that there was no indication for treatment."

17/V.'97. Media transparent; disks recognizable, not atrophic; retinal veins small. The child, formerly very excited and restless, now quieter. 18/V., 8/XII., '97. Movement of eyes normal. Optic disks seen somewhat blurred. Vessels visible, but scant and small. 9/III.'98. Optic disks and vessels much clearer, though still veiled and small. Ocular movement and child's behavior much improved. 23/V.'98. General condition better; is now three years and nine months old. 1/VII.'98. Slight acute conjunctivitis. 8/VIII.'98. Saw her at Gallilee, New Jersey. Condition still better. 29/X.'98. General condition improved. Optic disks slightly pale, vessels larger, but not yet of normal calibre. Fundus normal; slightly veiled. 3/XI.'98. Slight vitreous opacities and temporal pallor of the optic disks. 12/V.'99. Better. 3/XI.'99. Background normal, and apparently vision also. 20/XI. 1900. After homatropin: skiascopy, myopia 5 or 6 D. Thin and large zonular cataract in both eyes. Edge defined; only a few short "riders." 14/XI. 1901. Glasses comfortable, 20/100. Skiascopy: -4^s-2^c h. Optic disks temporal crescents; some temporal pallor. Mental condition much better. 17/IV. 1901. No change. 3/I. 1902. Glass: $-2-2^c$. Zonular cataract well defined, though thin; at periphery some denser lines. 29/XI. 1902. R. $\frac{2}{8}$; L. $\frac{3}{8}$. Condition as before. [Last seen by H. K.]

From the symptoms of this case I would think that the zonular cataract was caused by a nutritive disturbance.

The meningitis which Dr. Starr admitted in this child extended into the interior of the eye, causing neuro-retinitis and uveitis serosa. When I saw her at first, I could see no details of the background, as in serous uveitis. After the clearing, there was still neuro-retinitis which disappeared, leaving some temporal pallor of the disk. The changes in the periphery of the lenses were in patches and lines which could be seen only two or three years. They were in stripes, which broadened, coalesced, and developed in a regular lamellar cataract. In such a positive case, where the successive stages could be followed, it is difficult to ascribe

an—even partial—influence to the tetany. For future studies in this field, I would propose to examine the interior of the eyes in rachitic children.

PLEXIFORM NEUROMA OF THE ORBIT.

BY DRs. CHAS. H. BEARD AND E. V. L. BROWN, CHICAGO.

(*With one text-plate, in violet monochrome, No. III.*)

ACCORDING to Terson, of Paris (*Encyclopédie française d'ophtalmologie*, vol. v., p. 545, 1906), Valentine Mott, among the published reports of five cases of what he termed *pachydermatocoele*, in one instance described the clinical features with sufficient exactness to warrant its being recognized and classed as a plexiform neuroma. This was prior to 1850. The first to have a more definite understanding and to give a more intelligent description of this form of growth was Verneuil, who gave it the name it now bears. Verneuil reported two cases, one affecting the skin over the cervical plexus, and the other that over the sacrum. The first case in which the seat of the tumor was the region of the eye was published by Billroth in 1863, and with it appeared also the first description of the microscopic findings. Billroth lengthened the name by calling it *plexiform neuro-fibroma*. Bruns, who in 1870 reported five cases, suggested two appellations, viz., *neuroma elephantistica*, because of its supposed relation to elephantiasis, and *neuroma cirroideum*, because of the characteristic appearances of the pathologic anatomy.

Plexiform neuroma is a rare affection, not to exceed forty cases having thus far been reported. Of these only one previous case has been published in this country,—not taking into account those of Mott, just alluded to. This was by De Schweinitz, of Philadelphia, in the *Transactions* of the American Ophthalmological Society, xxvii., 1891. As regards its favorite seat, this variety of tumor is peculiarly a

subject of study for the ophthalmic surgeon, since the temporo-palpebral region, or the orbit, is the part involved in eighty per cent. of the cases. Invasion of the orbit occurs in about one-eighth the entire number. Those not in the immediate vicinity of the eye are situated, for the most part, either at the nape of the neck, on the back, or on the arm.

Our case in point is that of Dr. G. R., age thirty-seven. The patient, himself the picture of health in other respects, manifestly and avowedly free from syphilitic or other taint, comes of healthy parents, and is one of some six or seven robust children, of both sexes, the whole family being yet alive. No other member is the subject of any sort of tumor. Dr. R. consulted me first in December, 1902, relative to a growth in the right orbit. He had been aware of its presence for only about five or six years, though a photograph, taken fourteen years previously, showed unmistakable prominence of the right eye. The right upper lid is thick and drooping, and the skin covering it is deeply pigmented. The conjunctiva and the globe are normal in every respect, save that the latter is displaced downward and forward. The vision is $\frac{2}{80}$ and the fundus presents no anomaly. The left eye is normal. Palpation reveals a tumor whose most prominent part is just beneath the central portion of the upper rim of the orbit, and which, apparently, extends deep into that cavity. The tumor is elastic, but rather firm to the touch; neither it nor the exophthalmos is reducible; pressure upon the mass gives pain. "No *bruit*, no pulsation. There is no adenopathy about the face, though there are a number of small hard knots, or gristly bunches, to be felt in, or rather beneath, the skin of the right temporal region and in front of the ear. Some of these bunches are sensitive, and are often painful, particularly after long continued use of the eyes in near vision. The patient had noticed these nodes long before he knew of any disturbing element in the orbit. He had observed the first appearance and the development of several of them. During the period of growth and for a considerable time after attaining full size, they were sensitive and painful, as stated; then, gradually, they became less so, until all sensation in them disappeared. There is no loss of function in the nerves supplying the skin of the affected area. There are no new growths on other parts of the body. The left eye and its appendages are normal.

Surgery was mentioned as the probable resort, and the patient departed, not to return until the 11th of the following May. The exophthalmos, the thickening of the lid, the pigmentation, and the ptosis were all accentuated; the vision reduced to $\frac{2}{10}$ -1 and in addition the retinal circulation showed slight signs of stasis. Immediate extirpation was advised, but the patient went away to consider. Nothing more was seen of him till May, 1904, when the above symptoms were still more pronounced, and the sight reduced by strangulation to $\frac{2}{10}$. Extirpation was again urged, and this time consented to, and the same performed May 18, 1904.

The Operation.—The supercilia were shaved and an incision made, beginning at the median line between the eye-brows, and extending outward over the rim of the orbit and then downward to a point opposite the outer canthus. The incision was carried through all the tissues down to the periosteum. On opening the wound the tumor presented at once as a smooth, red mass. It was readily loosened; yet back near the sphenoidal fissure it was tightly adherent and its removal proved delicate and laborious. Bleeding was profuse. Its size was about that of the average thumb,—its greatest dimension lying fore and aft,—and *it was enveloped by a rather dense capsule.* The roof of the orbit had become dome-like, to accommodate the growth, and at the centre of the concavity was a round depression caused by erosion of the outer table of the bone which would easily accommodate the tip of the finger. The lachrymal gland was not involved. The tumor was but slightly attached to its capsule, and was about the color and consistency of hog-fat. It broke up upon handling, the fragments being held together by what appeared to be the trunk of a hypertrophied nerve (the supraorbital) running longitudinally through the mass. The cavity was washed out with sublimate solution, the opening in the *septum orbitale* was closed with catgut, and the skin sutured with silk. Recovery was rapid. The eye retreated, the ptosis disappeared, and vision returned to normal. The only nerve that lost its function was the supraorbital.

Diagnosis of plexiform neuroma was made by Dr. Brown, to whom a portion of the tumor was consigned, and whose report is a part of this article. The patient was last seen on October 10, 1905. There was at this time no evidence of a recurrence of the orbital growth; the right side of the forehead was still numb; a

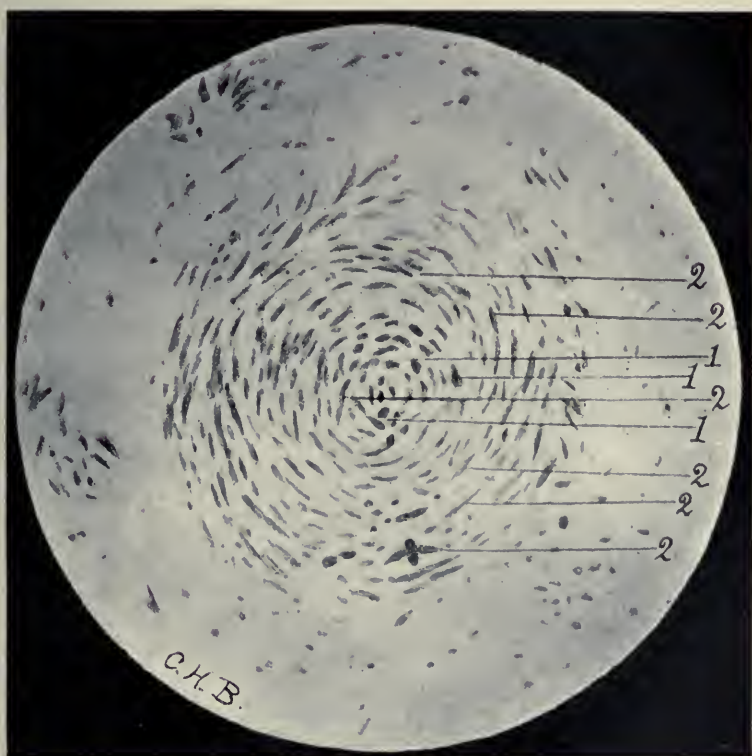
single new nodule had appeared in the skin near the right preauricular gland, while the old nodules scattered about beneath the adjacent skin were still present. The pigmentation of the skin of the upper lid remained unchanged, but the thickening and heaviness were gone. A study of the pathologic condition follows.

Gross Findings : (P. 102.) The tissue is a lobulated, roundish mass of tissue-strands, some 5cm long and 2cm wide ; the various strands are encapsulated and present fusiform varicosities.

On cross-section, each strand is found to consist of a well defined peripheral whitish zone or cortex, of a consistency varying from that of gristle to that of a hard-boiled egg, and surrounding a dark-brown centre or core.

Microscopical Findings. — Longitudinal sections show the strands to be made up of an outer and an inner zone; the outer is limited by a narrow fusiform-cell membrane beneath which lies a broader connective-tissue sheath containing many empty blood- and dilated lymph-vessels; the inner zone is composed of nerve substance everywhere altered in structure; where most closely resembling normal nerve, the individual fibre bundles are very wavy in outline, much distorted in their course, and often separated by an interval equal to their own width. Such approximately normal structures are often abruptly succeeded by larger areas, in which there is a marked cell-increase at the expense of the nerve fibres, so that they can only be identified with difficulty or not at all. In the transition zone are seen beads or chains of overlapping empty vesicular elliptical structures, with highly refractile contours, representing segments of degenerated nerve fibres. This degeneration becomes very marked in certain areas : the spaces assume an oval form, and the whole nerve substance gives way in large measure to a lymph-ectasiac reticulum. The cell elements in the areas from which the nerve substance has disappeared are greatly increased in number and densely packed together. The cells are of two forms: (*a*) long, narrow, fusiform cells staining heavily on cross-section; (*b*) large, round, faintly staining epithelioid cells.

On cross-section, the tumor strands present the same details of structure, with the addition of very striking nests of pearls of the closely packed round fusiform and epithelioid cells described above (see Text-Plate III). These have no special location with respect to particular areas of the tissue, but occur as well in the



TO ILLUSTRATE THE ARTICLE BY DRS. BEARD AND BROWN ON PLEXIFORM
NEUROMA OF THE ORBIT.

outer zone as in the inner although they are more numerous within the denser core of proliferated cells, among which many incompletely formed nests can be seen. The nests in the zone outside the main central area of cell-increase are sharply circumscribed, and may well be accounted for on the basis that they are branches of the main nerve to which the process is extending.

Anatomical Diagnosis.—Plexiform neuroma of the supra-orbital nerve.

In the cases reported in the literature to date, one finds the nodes or main clinical feature described in various and ingenious ways: thus, they have been likened to tortuous atheromatous arteries, to knots of catgut filled with hard material, and to tangled strands of gristle. They represent, in fact, the degenerated branches of the fifth nerve. And between the strands is found on anatomical examination a deposit of yellowish white material of the consistence of a fatty tumor. It is rather singular that Terson, in the article alluded to at the beginning of this paper, states that "the skin which covers the tumor [in plexiform neuroma] is remarkable by the absence of its pigmentation," whereas most authors, and our case, testify to the contrary, *i. e.*, that pigment is present in excess of the normal amount.

An important clinical sign of plexiform neuroma is the extreme indolence of the growth—or its freedom from pain and from all signs of activity. In the case herewith reported, however, the growth had been unusually rapid during the last few years. This form of a tumor is thought to be, as a rule, congenital. Of the cases published by Bruns, three were sisters whose mother had had multiple neuroma. The case of plexiform neuroma reported by Mr. Treacher Collins is the fourth of its kind to be associated with hydrophthalmos. The microscopic examination showed that, along with the plexiform neuroma, there was elephantiasis, both being congenital. Indeed, this is only one of a number of such instances, and several authors, in particular Emanuel, have considered the tumor under discussion but a variety of elephantiasis. Terson says that, in so far as it consists in a hyperplasia of the nerve-fibre coverings and

that of their supporting tissue, it conforms to one recognized kind of elephantiasis. Authorities are divided as to the point of departure of the new growth in plexiform neuroma, the majority affirming that it is the connective-tissue sheaths of the nerve fibres, and that epithelial elements are not conspicuous. On the other hand, perhaps, the more recent studies show it to consist largely of a proliferation of the walls of the vessels, thus approaching what is known as endothelioma or cylindroma.

The detailed anatomic findings in our case are probably best explained along the lines laid down by Hanke for this condition.¹ According to this author such soft, not sharply circumscribed, orbital tumors often grow to extensive lobulated masses of convoluted gristly strands of varying size beneath the normal skin—in the case under consideration the tumor extending along the supraorbital nerve from the supraorbital ridge to the sphenoidal fissure. Erosion of the adjacent bony wall occurs from pressure. The growth is often congenital and may follow trauma; operative procedures may cause it to increase, or it may spontaneously increase or decrease in size; in the late degenerative stage, the mass may fluctuate on palpation. Hanke considers that it is probably a primary hypertrophy of nerve-fibres followed by a degeneration which in turn excites a proliferation of the fusiform endo- and peri-neural and connective-tissue cells; these cells forming a closely pressed cell-rich swirl, or core, and about which there is a second zone of perineural cell-increase. Between and among these two groups of cells are larger endothelial cells, poor in protoplasm and derived from the endothelium of the hyperplastic lymph vessels and spaces. The nerve-fibre degeneration and the dropsical condition of the entire trunk reduce the nerve at length to a soft, myxomatous mass within the epineural capsule.

These tumors are very generally regarded as non-malignant, yet they will recur if not absolutely eradicated. If we are to believe a strangely precise statement made by Garré, "In $\frac{1}{8}$ of 1 per cent. of the cases, sarcomatous degeneration takes place."

¹ *Arch. f. Ophth.* lix Bd. 2, p. 315, 1904.

It will be observed that the tumor treated of here was enclosed in a strong capsule. This caused it to seem firm and elastic to the touch. Moreover, it made of this particular case an exception, in that these growths are, as a rule, not sharply circumscribed, and that they usually feel soft on palpation—like a lipoma,—or, as Panas expresses it, they have a *doughy* feel. They sometimes attain considerable size—as large as a hen's egg, or larger. Their treatment is pre-eminently surgical.

A CASE OF PARINAUD'S CONJUNCTIVITIS, ACCOMPANIED BY ERYTHEMA NODOSUM AND TONSILITIS; WITH A SUMMARY OF THE THIRTY FOUR REPORTED CASES.

By CHARLES NELSON SPRATT, B.S., M.D.,
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IN 1889, Parinaud¹ described a rare form of conjunctivitis which he considered to be of animal origin. The distinguishing features of the disease consist in the formation of superficial ulcers and pedunculated masses of the conjunctiva, small yellowish nodules in the subconjunctival tissue, and an enlargement of the pre-auricular gland, which in cases may break down and form an abscess. The disease is almost always unilateral and the cornea is uninvolved.

The writer has recently seen a case of this disease, and as up to this time there have been but thirty-three other cases reported, it seems advisable to place this one on record.

Mrs. J. F. W., a housewife, age thirty, consulted the writer September 19, 1905, and from her the following history was obtained. Eleven days ago (Sept. 8th), on awakening, the lids of the right eye were found to be swollen, and the eye could be opened only with difficulty. The same day, swelling and tenderness were noted over side of face, just in front of right ear. On September 14th and the following day or two, she had some pain over side of head, accompanied by general malaise. The eye was red and there was a slight watery discharge, also some itching, but no pain or photophobia.

Patient describes condition as being like an attack of the grippe. She was in bed one day. The eye gradually became more injected and the œdema of the lids more marked. The

swelling over right side of face increased, and mastication was painful. There had been no change in the condition four or five days previous to the examination made by the writer.

Examination (eleven days after onset) was as follows : O D: There is œdema of both lids, with marked ptosis. The skin is tense and smooth, but not red. There is profuse lachrymation, but no photophobia. The bulbar conjunctiva is much injected and chemotic. Conjunctiva of the upper lid is moderately injected. On the inner half there is a grayish oval area, 6 x 8 mm in extent, slightly raised above rest of conjunctiva. The surface of this is roughened and there is a loss of tissue. There is a similar but smaller area on outer portion of lid near the margin. The lower lid shows several translucent whitish areas, 1-3 mm in diameter ; no ulcers or granules are present.

Beneath the chemotic bulbar conjunctiva are numerous gray translucent masses from $\frac{1}{2}$ -2 mm in diameter. These are especially numerous on the portion corresponding to the palpebral fissure. At the limbus (inferior nasal portion) are two white masses, raised above the level of the conjunctiva and cornea, each 3 mm in diameter. The cornea is uninvolved; vision= $\frac{5}{6}$. Left eye white. The region over the right parotid and pre-auricular gland is much swollen and tender. The skin is tense and white. Both submaxillary glands are enlarged. The tonsils are red, swollen, and painful. Temperature 100.2°F. with depression and malaise.

On September 21st, the masses in the subconjunctival tissue had become more opaque and of a yellowish color. Under local anæsthesia several of these were excised and the conjunctiva closed with sutures. The following day the eye showed less injection, the chemosis was not so marked, and the patient said that she felt better. The temperature, however, remained elevated (100.5° F.).

On September 23d, several small red spots appeared on the skin over anterior surface left tibia, right patella, and left forearm. The next day these spots had become tender, roundish swellings, freely movable on the deep parts. The skin was tense and bright red. Similar swellings appeared in skin over right tibia and calf of leg. Diagnosis of erythema nodosum was made.

By Oct. 3d the skin lesions had practically all disappeared and the throat appeared normal. The eye was decidedly

better. There was no chemosis, the ulcers were healed, and there was moderate injection of the conjunctiva. The masses in the subconjunctival tissue were of an opaque yellow color and showed no signs of breaking down. About this time distinct fluctuation was noticed in the swelling over the pre-auricular gland. This was incised and a thin yellowish pus was evacuated, leaving a cavity 1 x 2 cm in extent. This was swabbed with pure carbolic and packed with gauze.

The patient returned home October 8th. At this time there were 6-8 small yellow nodules in the conjunctiva. The eye was almost white and the ptosis had disappeared. She was heard from October 30, 1905, at which time the eye was white and the incision into the gland had almost entirely closed.

The right submaxillary gland was, however, enlarged; duration seven weeks.

The tissue removed at operation was hardened in Zenker's fluid. Celloidin sections were made and stained with hæmatoxylin and eosin. The microscopic examination shows the subconjunctival tissue to be densely infiltrated with round cells. Plasma cells and large phagocytic epithelioid cells containing detritus and necrotic nuclei are numerous. One striking feature consists in areas staining deeply with eosin. Here the cells are necrotic and the nuclei show fragmentation to a marked degree. Numerous strands of fibrin are present in the areas. Capillaries are present in large numbers. Leucocytes are almost entirely absent in sections cut from the larger of the two pieces of excised tissue. Sections cut from the tissue removed from the limbus show a loss of epithelium, and in the necrotic areas large numbers of leucocytes are present. This nodule was probably an older lesion than the other, and as it projected somewhat above the level of the conjunctiva, had lost its surface from friction of the lid. The leucocytes were probably due to a secondary infection. Pus from pre-auricular gland showed staphylococci.

Verhoeff and Derby² have given the most accurate pathologic description of the condition. They lay special emphasis on the necrosis of the subconjunctival tissue and the absence of leucocytes. In addition to the histological examination, they made animal inoculations and cultures, with negative results. The same writers³ have recently

reported a second case, with a review of the pathologic findings of all the reported cases.

The following are all the cases reported since Verhoeff and Derby's first paper.

CASE 1.—(Sterling and McCrea.⁴) Male (age ?). O D: inflamed, lids swollen, and ptosis for ten days. Examination showed marked œdema of the lids, ptosis, lachrymation, and photophobia. Palpebral conjunctiva thickened and injected. Dotted over it, and especially over the inner third, were papillary granulations, which were of large size in retrotarsal fold. Ocular conjunctiva red and irritable, no chemosis, and vision not affected. Ten days later chemosis appeared and pre-auricular and cervical glands became enlarged. Temperature 99.2–100°. Pre-auricular, submaxillary, and cervical glands incised and pus and necrotic tissue removed, followed by marked improvement. Duration three months. Cultures from parotid gland and conjunctiva showed a bacillus, probably xerosis.

CASE 2.—(Matys.⁵) Male, age forty. O D: became red and painful, lids swollen so that eye could not be opened. Bulbar conjunctiva was normal. Two weeks later chemosis was marked, and nodules, size of head of pin, present in conjunctiva. Much pain in eye. Temperature 38.2° C.; patient weak. Pre-auricular and submaxillary glands swollen. Two months later chemotic conjunctiva covered $\frac{2}{3}$ of cornea, which, however, was uninvolved. Pre-auricular and submaxillary glands incised and pus evacuated. Ten months before eye was normal.

CASE 3.—(Salva.⁶) Male, age sixty-five. Was switched in O S eight days previously by the tail of a horse. Examination: Lids (left eye) swollen; conjunctiva red, injected, chemotic. Slight exophthalmos, ocular movements diminished, and diplopia was present. Pre-auricular and parotid glands enlarged. Three days later, there were seen in the inferior internal quadrant and along the border of the inferior fornix about twelve small semi-transparent, red granulations, some tending toward yellow. Some of those were on bulbar conjunctiva; the caruncle was also seat of a granulation. The largest were size of pin head. No granulations on superior tarsus. Symptoms subsided and patient returned to work in about six weeks after onset. No suppuration of glands. Disease occurred in May.

CASE 4.—(Dunn.⁷) Girl, age seventeen. Lids (O S) became

swollen so that lid could be raised only with difficulty. One week later, gland below left ear was swollen but not painful. Examination showed much congestion in upper $\frac{1}{2}$ ocular conjunctiva, upper cul-de-sac, and lid, with 2-3 rows of glue-like papillary excrescences studded over region of upper cul-de-sac. There was no pain, but there was excessive lachrymation and lids felt "sore." V=N. Onset of disease in September. Duration of ocular condition five weeks. Gland swollen two weeks longer.

CASE 5.—(Ellett.⁹) Male, negro, age eleven. Duration of disease four weeks. Examination O S: lids swollen, muco-purulent discharge. Bulbar conjunctiva and cornea normal. Upper fornix occupied by 12-15 large flattened granulations, with whitish tops. Conjunctiva lower lid, thick and rough with granulations; cervical glands suppurated. Pre-auricular gland enlarged. Examination of sections showed granulations consisted almost entirely of round cells with new-formed connective tissue, and small necrotic areas showing nuclear fragmentation. Epithelioid and plasma cells were present. Duration ten weeks.

CASE 6.—(Ellett.⁹) Boy, age eleven. O D: conjunctiva lower lid, red and thick. Scattered over it were 7-8 whitish nodules, size of follicle in follicular conjunctivitis, surface white and opaque. Fornices free. Few nodules present in upper lid, also in central portion of upper fornix. Slight conjunctival discharge. Pre-auricular and submaxillary glands enlarged. Sections of excised tissue showed granulation tissue packed with round cells. Duration one month.

CASE 7.—(Ellett.⁹) Female, age eleven. O D: Patient seen one week after onset. Subconjunctival tissue near upper fornix became thick and having appearance of sand or minute frog spawn. Bulbar conjunctiva also involved. Several white, sharply defined plaques scattered over surface of conjunctiva in fornix. Pre-auricular gland swollen, hot, and tender. Glands in neck swollen. Duration one month.

CASE 8.—(Posey.⁹) Male, (age ?) Surgeon just returned from Porto Rico. O D: onset six weeks previous, with œdema, muco-purulent secretion, chemosis, and granulations in conjunctiva. Three weeks later, pre-auricular and parotid glands became swollen and tender and later suppurated. Examination: Lids swollen; conjunctiva thickened, especially in fornices; there were pedunculated granulations. Bulbar conjunctiva injected and thickened. Cornea unaffected. Temperature elevated. Parotid was incised

and a small amount of pus evacuated. Submaxillary, retro-maxillary, and cervical glands swollen. Patient was a subject of Malta fever. Duration twelve to fourteen weeks.

CASE 9.—(Griffin.¹⁰) Female, age fourteen. In November, O S became suddenly inflamed, attended by pain, photophobia, marked œdema of the lids, and profuse lachrymation becoming purulent in a couple of days. End of week acute condition had subsided, although eye remained red and irritable. Examination two weeks after onset: Situated on retrotarsal fold is a mass of polypoid granulations, between which were a few areas of superficial ulceration. One large granulation somewhat pedunculated and translucent, and several small granulations, reddish gray color and irregular outline, were present. Slight injection of the ocular conjunctiva. In three weeks after onset the granulations had disappeared. About this time the pre-auricular gland became enlarged and painful; similar condition of submaxillary and cervical glands. No suppuration. Duration five weeks.

CASE 10.—(Verhoeff and Derby.⁹) Girl, twelve years old, with history of swelling of upper lid, right eye, and swelling near angle of jaw same side. Examination, eleven days after onset, showed thickening upper lid, slight ptosis, no secretion, and slight conjunctival injection. Upper portion of bulbar conjunctiva was thickened, red, and contained small yellowish granules. Conjunctiva of lids was slightly injected. Duration four to five weeks. Microscopic examination showed cell necrosis and round-cell infiltration.

Goldzieher,¹¹ in a recent article, reports five cases considered by him to be examples of Parinaud's conjunctivitis. Three of those were reported eleven years ago and were not included in Verhoeff and Derby's series, as from Goldzieher's histologic reports they considered the cases to be examples of lymphoid hypertrophy. Verhoeff does not consider the other two cases to be examples of Parinaud's conjunctivitis.

In the British *Lancet*, Streatford,¹² an Indian surgeon, states that he has frequently seen a peculiar form of conjunctivitis among the coolies in the tea gardens of Upper Assam. This is characterized by marked œdema of the lids, injection of the palpebral and bulbar conjunctiva, and is accompanied by an enlargement of the pre-auricular gland. The disease is almost universally unioocular and occurs in children and old persons. The duration is from two to six weeks, although it may become

chronic and last two to six months. He has seen three cases occurring in Europeans. From this description the disease would seem to be identical with Parinaud's conjunctivitis.

SUMMARY OF THE THIRTY-FOUR REPORTED CASES.

Eye affected—Parinaud's conjunctivitis, is, with few exceptions, unilateral. In but two cases were both eyes affected. The significance of the fact that the right eye was involved in 21 cases, and the left eye in but 11 cases, is at present unknown. The possibility of transference of the infection to the eye by the hand seems probable. Most persons being right-handed, the corresponding eye would naturally be more likely to be infected.

Sex—The disease occurred 18 times in males and 16 times in females.

Age—The youngest patient was two years, oldest six years. The majority of cases were in young adults. Six cases occurred in children under ten years of age.

Locality—With the exception of one case—an officer in Porto Rico,—all occurred in temperate climates; 17 of these in France, 14 in the United States, and one each in Bohemia, Canada, and Porto Rico.

Season—The onset of the disease, arranged according to months, is as follows:

October, 8; November, 7; September, 4; July, 3; May, 3; 2 each in January, December, and June; 1 each in April and February; 1 case not stated; 24 cases occurred in the autumn and winter (September to February), and only 9 cases in the remaining six months.

Duration—The shortest case lasted two and a half weeks, the longest (Matys) ten months, the average time being five to eight weeks.

Suppuration of glands—This occurred in twelve cases and materially prolonged the duration of the disease after the eye condition cleared up.

Etiology—The etiological factor of Parinaud's conjunctivitis is unknown. There is no evidence to show that Parinaud's idea of its being of animal origin has any foundation.

The diagnosis of Parinaud's conjunctivitis, as a rule, offers no difficulty, as the course of the disease is entirely different from any other form of conjunctivitis. In the early stages it might clinically be confounded with trachoma, tuberculosis, follicular conjunctivitis, and lymphoid hypertrophy, as any one of these might be confined to one eye and be accompanied by an enlarged pre-auricular gland. In the two former conditions, the course of the disease would render the diagnosis certain. The presence of corneal involvement in trachoma and the ulceration and chronicity of tuberculosis would be of great importance in arriving at a diagnosis. Lymphoid hypertrophy and follicular conjunctivitis, and especially the former, might be mistaken for Parinaud's conjunctivitis. Microscopical examination would in any case clear up the diagnosis.

Treatment—The only treatment of any apparent value is destruction or removal of the nodules. Excision of these, followed by suture of the conjunctiva, is preferable to burning or caustics.

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A CASE OF ANTIPYRIN AMAUROSIS INDUCED BY ONE HUNDRED AND THIRTY GRAINS TAKEN IN FORTY-EIGHT HOURS.

By F. C. HOTZ, M.D., CHICAGO.

(With two charts in text.)

THERE seem to be only a few cases of antipyrin amblyopia on record. In the very exhaustive reference work recently published¹ only three cases are mentioned. In one case, a lady had taken fifteen grains of antipyrin, and five minutes afterwards became ill with palpitation of the heart and totally blind. The amaurosis lasted one minute only, and the sight was completely restored in three days. In the second case, a lady had taken fifteen grains after a meal, and three minutes later suffered from violent headache, tinnitus, vertigo, palpitations, dyspnœa, and cold perspiration. After twenty minutes she lost her sight, and the amaurosis lasted thirty minutes. In the third case, a man had been taking three tablets of antipyrin (ten grains *pro dosi*) at one-hour intervals, when he had an attack of migraine which came on about once a week. After several months his sight became blurred, but it is not said how long the amblyopia lasted.

In the first two cases, the transient amaurosis following after fifteen grains of antipyrin may well be attributed to idiosyncrasy; for Dr. De Schweinitz,² who experimented on himself with ten-grain doses, noticed no amblyopia, but only a visual disturbance similar to the scintillating scotoma frequently preceding an attack of migraine.

It seems then that antipyrin has no serious effect upon the

¹ *The Effects of Drugs and Poisons on the Eye*, by Dr. L. Lewin and Dr. H. Cuillery, Berlin, 1905.

² *Toxic Amblyopias*, p. 209.

eye if taken, as it usually is, only occasionally and in moderate doses. But if a large amount is introduced into the system, in a short time it can produce a profound amblyopia lasting many weeks, as the following case may show.

February 22d, 1905, Mr. K., age thirty-three, came to me with the following history: Has had migraine off and on for a number of years, as his mother had had before him. Had typhoid fever at twenty-three, with good recovery. For three years in succession had attacks which were declared to be rheumatic, consisting in extremely painful red spots on limbs and body, yielding to antipyretics. Such attacks lasted two or three weeks, not attended, as far as he knows, by fever. Two weeks ago suffered with severe neuralgic pains in the right side of the head and both eyes. Movements of the eyes caused sharp pain, but his sight was not disturbed, as he could attend to his desk-work comfortably. The pain then shifted to the other side and was not relieved by quinine and salic. acid of which he took 4 grains (of each) every 4 hours for 3 days. He was then given antipyrin in capsules containing 5 grains, of which he took 26 within a period of 48 hours. He noticed at the end of the course of antipyrin that his sight was failing and within 48 hours was practically extinguished. For 12 or 14 years he has been closely confined to clerical work; does not use liquor, but has been smoking to excess, using a pipe at his desk.

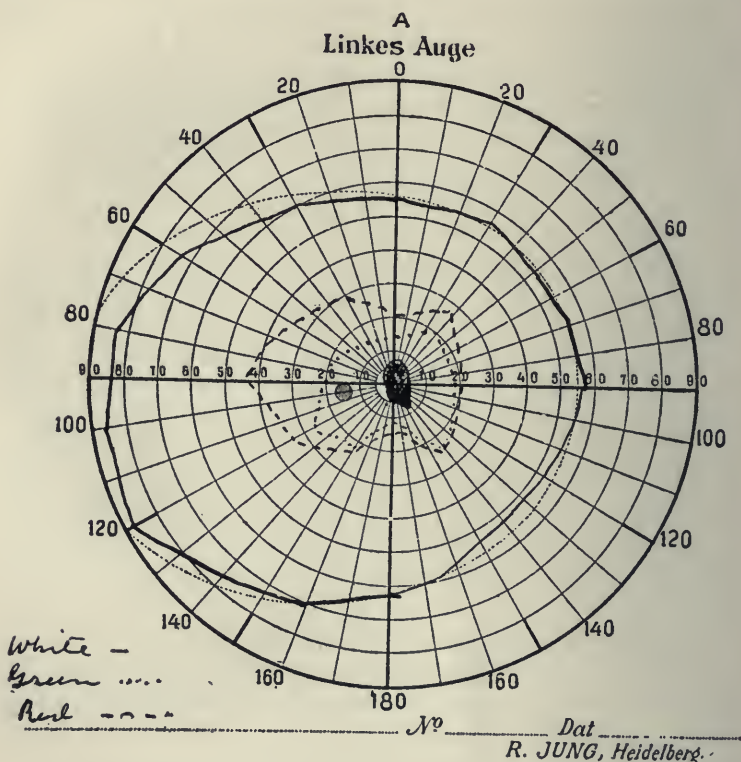
He can now see fingers in the peripheric field, but central vision is abolished. Eyeballs are not tender to the touch, pupils widely dilated, not reacting to light, and but faintly to convergence. Tension normal, media clear, temporal half of disk very pale, and retinal vessels very thin.

In order to ascertain whether there was any underlying lesion of the nervous system, I sent the patient to Dr. Church, to whom I wish to express my sincere thanks for his valuable assistance in the case. He reported his examination detected nothing abnormal in the nervous system, the reflexes were somewhat exaggerated owing probably to his taking strychnin, the heart action a little rapid and irregular.

The patient was put into a hospital, and treated with pilocarpine sweats, colonial flushings, and Blaud's pills.

March 1st.—Pupil active; no change in fundi. R E, fingers 4 feet; L E fingers in peripheric field.

March 8th.—R E, V $\frac{2}{10}$, calibre of retinal vessels almost normal, and disk shows better color. L E, fingers 4 feet; vessels still contracted and disk pale. Perimetric tests: R E, no scotoma, slight contraction of temporal form field, and marked contraction

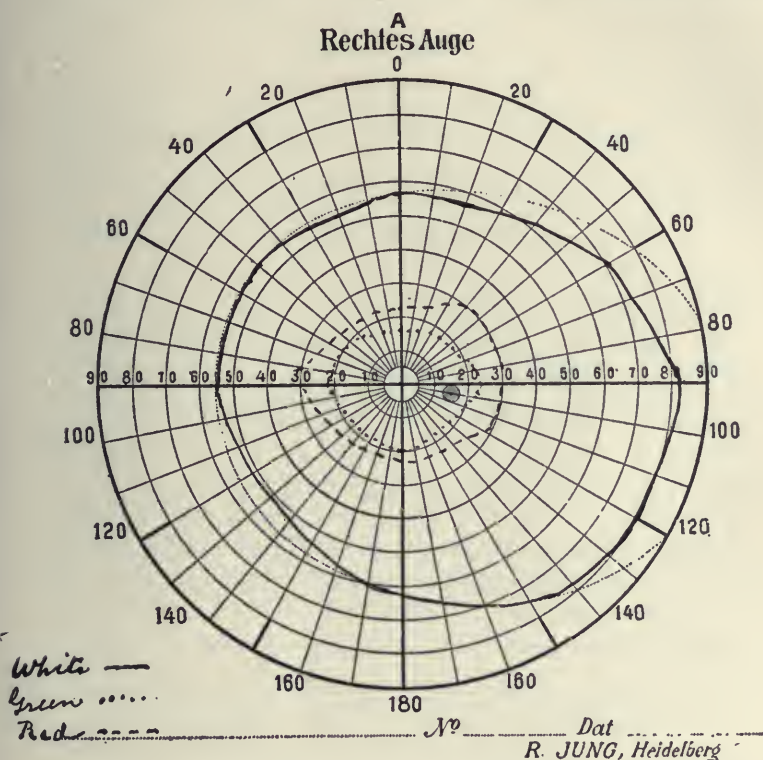


of color fields; L E, small central scotoma, an irregular vertical oval, slight contraction of temporal form field, and marked contraction of color fields.

The patient then returned to his home in Kansas, where he was further treated by Dr. J. C. Brown of Wichita, who reported under April 5th: R E, V $\frac{2}{10}$ and L E, $\frac{2}{10}$, normal fundi, and sent perimetric charts showing normal fields for form and colors.

As this patient has been smoking excessively, and had also taken quinine and salic. acid before the antipyrin, it might be questioned whether the amblyopia was caused by

the antipyrin alone. Aside from the sudden and rapid development, which speaks against tobacco amblyopia, and aside from the fact that the vision was undisturbed for several days after the use of quinine and salic. acid, the peri-



metric charts, I think, furnish the best evidence that tobacco and quinine were not the disturbing factors. In tobacco amblyopia, the visual field is not contracted, but central color scotomas are the rule; in quinine amblyopia, central scotomas are absent, and excessive contraction of the field is the rule; while in our case we had a slight contraction of the field and central scotomas. These findings and the sudden onset of the amblyopia directly after the use of the antipyrin point unmistakably to this drug as the cause of the amblyopia.

A CASE OF TRANSIENT LEAD AMAUROSIS.

BY DR. OTTO LOEWE, FRANKFORT-ON-THE-MAIN.

Translated from the German Edition, October, 1903, by Dr. MATTHIAS
LANCKTON FOSTER.

TRANSIENT amaurosis, due to lead poisoning, is of the greatest rarity in comparison with the frequency of the toxic affections of other organs due to the same cause. The older writers, W. White, Beer, Duplay, and, above all, Tanquerel des Planches, furnished a number of articles on this subject, which are not to be absolutely neglected because of the absence of a differential diagnostic ophthalmoscopic examination, but up to the present time there have been only five observations accurately established by the help of the ophthalmoscope. Therefore it seems proper that every case of this nature should be put on record.

On January 13, 1903, a blind man, twenty-four years of age, was brought to the clinic and gave the following history. For two years and a half he had been engaged in work in which the workmen were greatly subjected to lead poisoning, in spite of the customary methods of prophylaxis, but without suffering himself. For the past week he had suffered from pain in the head and body and had lost his appetite, yet had continued working until the day before yesterday. The vision of his left eye had always been better than that of the right, so much so that in his military service he aimed with his left eye, but the vision of the better eye had not been perfect as he could not shoot at 500m. Until the evening of January 12th he had noticed no change in his vision, but during that night he struck a light and found to his horror that he had lost all perception of light. In the morning there was no improvement, so he sought the clinic.

Status, Jan. 13th.—Patient lies quietly in bed, fully appreciative of his condition and surroundings and gives clear answers. General condition of nutrition fairly good. Face red with a slight yellowish tinge. Respiration 18, pulse full and tense. Limbs freely movable; facial muscles respond promptly. No peculiarities of hearing, speech, or reflexes except the pupillary reflex. Teeth, for the most part, carious. Distinct grayish black gingival line. Marked fœtor of the breath. Abdomen neither swollen nor the reverse. Palpation painful, but revealed nothing. No changes in lungs or heart. Subjective symptoms: diffuse headache, some dizziness, colic, appetite bad, thirst fairly great. No movement of the bowels for the last four days, no micturition for a longer time.

Ocular Condition.—Motility of eye good. The glance is void of expression. The pupils dilated almost to the maximum and react but slightly. Conjunctiva somewhat yellow, cornea and other media clear. No pathological condition in the fundus, no anomalies of pigment or hemorrhages. The papilla and macula are intact, the arteries and veins filled as usual. Complete amaurosis.

Treatment.—Ice-bag to the head, castor oil, iodide of potassium, Priesnitz's wet pack to the body.

Jan. 14th.—Headache, nausea, and colic somewhat abated. The amaurosis and the anuria persist although the bowels have moved.

Jan. 15th.—On awaking, the patient could count fingers at 1m. Urine passed for the first time; contains traces of albumin.

Jan. 16th.—Counts fingers at 4m. Colic and nausea becoming less and less. Treatment unchanged.

Jan. 20th.—General condition much better. Counts fingers at 15m. No albumin in urine. Only a slight degree of icterus.

Feb. 1st.—The icterus, colic, and headache have almost entirely disappeared. Vision has returned considerably. Patient complains of dizziness and flickering before the eyes only on looking into the bright light for a minute.

Feb. 10th.—Patient is up several hours every day. Vision, left $\frac{1}{2}$, right $\frac{1}{8}$. Fundus, visual field, and color sense perfectly normal. Subjective condition good except that after walking or standing long the patient complains of weakness in the bones. Treatment, warm baths daily.

Feb. 25th.—Icterus and discoloration of the gums gone. Patient out of bed nearly all day.

March 5th.—Still a little dizziness on looking long in the light. General condition satisfactory.

March 14th.—Patient discharged, cured and able to work.

To establish the diagnosis of amaurosis saturnina, the following line of thought must be followed. A central affection only can account for the sudden onset of blindness with clear refractive media and absolutely normal ophthalmoscopic condition. The number of such affections which can bring about this condition is very small, and consists almost wholly of sudden loss of blood and toxic causes, excluding hysteria and the blindness which occurs in Jacksonian epilepsy. In hysterical amaurosis the pupillary reaction is always retained, and in Jacksonian epilepsy total amaurosis and undisturbed vision alternate. The red cheeks of the patient excluded the thought of a sudden loss of blood, and left remaining only the toxic forms of amaurosis. Among these, next to that of quinine poisoning, which was excluded by the history, the uræmic form is the most common, which is met with not so rarely in lying-in wards and is also sometimes observed in acute nephritis—for example, after scarlet fever. The dizziness, the headache, the nausea, and above all the anuria would indicate that uræmia was the cause in this case, while the fœtor of the breath and the well-marked discoloration of the gums point in a different direction. The differential diagnosis from uræmia can be best established in a discussion of the theories of lead amaurosis.

A review of the literature shows that the 60 or 65 reported cases of ocular disturbances due to lead fall into two very unequal parts, without reference to the cases of muscular paralysis, the more frequent permanent, and the transient cases of blindness. This division, already made by Günsburg from the clinical course, recommends itself because the pathological condition in the two forms is different, even though there are theoretically interesting transitional forms, as was shown by Paci's case. The division then is into:

1. Amaurosis or amblyopia with fundus changes, optic atrophy, or neuritis. In this class also belong the cases of

retrobulbar neuritis in which, despite the normal appearance of the fundus, the visual fields are contracted and there are disturbances of color perception.

2. Amaurosis of a transient character, which reaches its greatest intensity in from a few hours to a few days and then rapidly gives way to complete or nearly complete visual acuteness, in accordance with the declaration of Stoll over a century ago: "Amaurosis symptomatica morborum spasticorum, morbi hysterici, colicæ saturninæ, temporaria solum est et finito paroxysmo sponte evanescit."

The first form is certainly more common than is usually thought, for in patients suffering from encephalitis saturnina the complaints are very frequent of a reduction of vision. Recently I saw a temporal paleness of the optic nerve in a typesetter who came under treatment with discoloration of the gums, severe neurasthenic symptoms, loss of memory, halting speech, and general cachectic symptoms. This blindness, based on positive fundus conditions, lies outside the scope of our work, and lacks to the investigator the stimulation afforded by the transient form, frightful in its very sudden appearance, obscure in its causeless disappearance. Yet between the two there is a transition form in which the blindness comes and goes at brief intervals, but after some months results in a high degree of amblyopia or amaurosis through gradual atrophy of the optic nerve. An interesting example of this is the case reported by Paci in *Lo Sperimentale*, xxxvi., of a soldier who had a bullet in his humerus, which at the time of its extraction had caused a transient blindness, but after its removal went on to complete amaurosis.

Now as to the etiology. The similar clinical histories given by six authors show that we have to deal not with an accidental symptom-complex, but with one indicative of a certain disease. Hirschler's, Haase's, Schubert's, Hirschberg's Günsburg's, and my cases all followed the same course. After general prodromal feelings of illness, all perception of light disappeared within a few hours, with increase of the symptoms of headache, dizziness, colic, even delirium. The pupils were dilated and reacted somewhat to light. In the

fundus no change, or only unimportant ones, insufficient to explain the loss of sight, such as distension of the retinal veins, and grayish red discoloration of the papilla with hazy margins. The amaurosis retrogressed in a few days. In most of the cases there were traces of albumin in the urine; in Günsburg's, hyaline and fatty casts.

The explanations advanced may be divided into three groups: one assumes nervous disturbances, another uræmic amaurosis due to lead poisoning, the third that a sudden ischæmia renders the eye incapable of performing its functions. There is no proof of the correctness of any one of the theories. Autopsies have not been obtained, except in the case of Tanquerel des Planches, and the result of this was negative. It is, as Walther said, an amaurosis in which the patient sees nothing and the physician also sees nothing.

The most unsatisfactory of the three theories is the first, which contents itself with obscure conjectures of functional affections of the nervous organ. That the profound Tanquerel des Planches should rest contented with such a theory may be explained by the state of knowledge at that time. The somewhat less elementary theory that was based on the demonstration of lead in the brains of poisoned men and animals was at best the first step toward an elucidation. Leber assumed that the lead, which normally is excreted by the kidneys, remains in the body during a temporary insufficiency of the latter and produces amaurosis by direct irritation of the nerves, a theory which also bears the mark of improbability.

Much more impressive than this old theory is the thought of a uræmia, which Traube appears to have been the first to suggest. But that experienced clinician had certainly never seen a case himself, for his profound method of research would not have allowed him to be deceived by the superficial resemblance. Yet the clinical picture, or rather a number of the prominent symptoms, renders it quite seductive. A patient who has been suffering from headache, nausea, and perhaps vomiting is seized with absolute amaurosis during an exacerbation of these symptoms. Urine is suppressed or scanty and contains traces of albumin, some-

times epithelial casts. The diagnosis of uræmia is ready. The history of occupation seems to favor it. Recently von Leyden published a large series of cases in which after working in lead a long time nephritis appeared as a symptom of the so-called lead kidney. And yet this diagnosis is erroneous. For, aside from the fact that the apparently characteristic prodromal symptoms may serve equally well as symptoms of lead poisoning, a noteworthy point must be taken into account, that in almost every case there was not the slightest haziness of consciousness, to say nothing of a comatose condition or of convulsions. And what physician will believe that a urine which contains scarcely demonstrable traces of albumin, and often not a single cast, comes from a severe case of uræmia? Add the always favorable outcome and the complete disappearance of the albumin, which would be excluded in a chronic lead kidney. Traces of albumin occur in almost all cases of poisoning and in almost all acute diseases, when poisons or toxines are excreted through the kidneys. Moreover if one tries to explain a very obscure case of the greatest rarity by calling in another extreme rarity, such as uræmic amaurosis, he calls upon the Devil to throw out Beelzebub. It is certainly difficult to explain the anuria or oliguria, but perhaps the suppression of urine might be due to the increase of water in the intestine, rendered cord-like by the colic and the consequent reduction of the secretion of urine, while on the other hand a slight irritation of the kidneys by the concentrated urine would explain the slight traces of albumin.

The third theory, the correctness of which I shall try to demonstrate, rests on the physiological action of lead in producing spastic contraction of smooth muscle tissue. Most of the symptoms of saturnismus can be explained by reference to this fundamental property. Thus Riegel demonstrated sphygmographically that, long before the onset of the subjective symptoms of lead colic, an increased tension was to be found in the arteries. During colic the sensibility of the intestine is inversely proportional to the tension of the arterial vascular system. The consequence of the spasm is ischæmia, and through that diminution of peristalsis, which is

synonymous with obstipation. The painfulness is due to the ischæmia, as has recently been shown by observations on angina pectoris. The cerebral disturbances may easily be ascribed to the chronic anæmia of the brain; the persistent spastic contraction brings about similar symptoms to those produced in syphilitic endarteritis by the gradual stenosis of the cerebral arteries by proliferative inflammation. In both cases we find on autopsy diffuse fatty degeneration of the ganglia and encephalitic foci accompanied by proliferation of connective tissue. Now we know how sensitive our eyes are to sudden loss of blood after injuries of the great arteries, after profuse gastrorrhagia, in atony of the uterus, and placenta prævia. Günsburg properly objects that in Hirschler's case alone were any signs to be seen in the fundus which would indicate that the quantity of blood varied from the normal, but we use for the perception of light not only the eye but also the conducting apparatus and the visual centres. It is well known that the brain responds promptly to a bad supply of blood, and also that a complete restitutio ad integrum takes place if a sufficient collateral circulation is established. The question arises why the function of vision alone should be affected by this uniform spasm of all the arteries, why a paralysis of the extremities, or of the respiratory centre, is not simultaneously produced? The answer to this question may be obtained from a study of the vascular supply of the brain. In every anatomical atlas of the brain, it is striking how poorly supplied with vessels is the occipital lobe, and especially the cuneus, in comparison with all the rest of the brain. A relatively slight disturbance, as a spasm of the arteries, suffices to produce a temporary insufficiency of the brain, especially when a primary weakness of the visual apparatus is present, the presence of which in our case may perhaps be conjectured from the probably congenital amblyopia. This explanation also gives us the key for those cases in which the blindness did not retrogress, or recurred after an interval of some weeks and then became permanent. In these cases, either in consequence of insufficient treatment, or from the intensity of the poisoning, the spasm of the vessels did not retrogress, or recurred after a

short interval and brought about a descending degeneration of the conducting apparatus. This theory of the origin of blindness is not contradicted by conditions of cloudiness and swelling of the optic nerve, which Stood took to be hydrops of the sheath of the optic nerve, yet as a consequence of the arterial spasm a venous stasis should be expected, which sufficiently explains the dizziness, the headache, and the flushed face. Wolf has shown that very analogous cases of acute deafness are to be explained by an acute hydrops of the labyrinth.

THE ACTION OF ALYPIN, A NEW ANÆSTHETIC, UPON THE EYE.

BY DR. ED. HUMMELSHEIM, PRIVAT-DOCENT AT BONN.

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Dr. WARD A. HOLDEN.

RECENT years have brought us a number of agents with which one sought to obtain the anæsthetic effects of cocaine while avoiding its unpleasant or dangerous effects. The latest of these new remedies is alypin, which, at the suggestion of Prof. Dreser, I have used in comparison with cocaine in the normal eyes of children and adults. The test of the anæsthesia was made by touching the cornea with a blunt instrument. The results proved on the whole to be alike for the two agents. In a few cases, for a time the alypin eye was found to be less sensitive than the cocaine eye, and in rather most cases the contrary was true, but usually there was no difference.

The centre of the cornea was found to be more sensitive than the periphery, as is the case in the untreated eye. After several instillations of the drug this difference was abolished.

Pharmacological tests by the manufacturers had shown that alypin is only half as toxic as cocaine. Usually cocaine dropped into the conjunctival sac causes no toxic symptoms. It would have been interesting, however, to have made comparative tests with patients, such as are occasionally seen, in whom a few drops of 2 % cocaine solution in the conjunctiva causes weakness or fainting; but in the short time during which the experiments were carried out no patient of this sort was under observation.

As regards the reaction of the vessels, it may be said that

there is dilatation in most cases, there being circumcorneal injection for a period ranging from five to thirty minutes.

The instillation of a 2 % solution causes a slight burning sensation for a minute or two, sometimes more pronounced, sometimes less than after the instillation of cocaine. Even a 10 % solution causes only moderate smarting.

Dilatation of the pupil is not produced by a 2 % solution. A 10 % solution causes some dilatation, but the light reaction is preserved. The mydriasis caused by strong solutions may pass off quickly or may last for hours.

The accommodation is affected but slightly and only for a short time.

The intraocular tension, which is generally believed to be reduced by cocaine, seemed to me to be equal, in eyes in which alypin had been instilled, to the tension in eyes in which cocaine had been instilled, even when Fick's tonometer with Koster's modification was used. In order to eliminate the personal equation, I had alypin dropped repeatedly into one eye of a subject, while nothing was done to the other, and then tested the tension without being aware which was the alypin eye. In each case I found slight hypotony in the alypin eye. Furthermore, after using the tonometer on an eye into which 2 % alypin had been repeatedly instilled, a 10 % solution was used and a later tonometric examination revealed always a slight further lowering of tension. When we recognize that alypin reduces tension in an equal degree with cocaine, it would appear to be indicated in diseases which require reduction of tension without dilatation of the pupil, such as glaucoma. When used in 1 or 2 % solution, it does not require the addition of eserine as does cocaine.

One advantage possessed by alypin is the fact that it may be repeatedly sterilized without losing its efficacy. No difference was observed between the effect of a fresh solution and one boiled five minutes.

And so far as my experiments went I found no injury of the corneal epithelium even after the repeated use of 10 % solutions.

From what has been said, further experiments with alypin

seem indicated in cases of cocaine idiosyncrasy, as a reducer of tension in glaucoma, and as an anæsthetic in cases in which dilatation of the pupil and paralysis of the accommodation are to be avoided. The hyperæmia which it produces may be prevented by using adrenalin.

ABSTRACTS OF ARTICLES IN VOL. XLI. OF THE
GERMAN EDITION, NOT PREVIOUSLY
PUBLISHED.

BY DR. MATTHIAS LANCKTON FOSTER, NEW YORK.

I.—ANATOMIC AND BACTERIOLOGIC STUDIES OF TRACHOMA.

BY DR. C. ADDARIO, PALERMO.

I.—STRUCTURE OF THE TRACHOMA GRANULE.

A SECTION through a trachoma granule shows a faintly stained innerspace with large cells and a well stained margin with small cells. In the smallest granules the innerspace is less developed and the margin broader than is the case in the larger ones. In both, the clear portion is usually distinct from the peripheric, as well as from a large number of closely packed cells which conceal any intermediate substance. Granules in the first stage of development are rare in which the proliferation of the centre is less marked, and the elements are not packed as closely as in the more developed ones. Such granules are usually situated deep under the adenoid layer, but may be found within it.

The granules first described are those of a diameter of about $0.24mm$ with clear innerspaces measuring $0.16mm$ across. The latter are filled with large cells and are surrounded by small intensively stained cells arranged in rows close together which fill long spaces in the loose connective-tissue stroma. The connective tissue contains fixed cells like those of the surrounding tissue. The lymphoid cells which fill the spaces are identical with those of the adenoid layer, with which the peripheral portions of the granules blend without sharp demarcation. The innerspace of a granule contains many cells which lie fairly far apart and allow a stroma to interpose itself between them. This stroma arises from peripheral connective-tissue trabeculæ which, by continual subdivision toward the centre becomes constantly smaller until

reduced to two or three cellular elements, between which can be traced the last fibrillary ramifications, or the last offshoots of the protoplasmic processes of the connective-tissue cells. Well developed granules which appear to be homogeneous contain an intercellular network composed wholly of connective-tissue fibres. The fixed cells have become separated from the connective-tissue stroma through their hypertrophy and are connected with it only by slender processes of protoplasm.

The fixed connective-tissue cells at the periphery of the initial granules are small, spindle-shaped, in some places triangular. The cells in the clear innerspace are for the most part flattened, of epithelioid appearance, and contain little protoplasm with faintly stained, rather granular nuclei, perhaps twice as large as those of the peripheral cells, some round or oval, some of irregular form. Some have in addition to the large nucleus a smaller one, perhaps a fifth as large, and among them nuclei undergoing mitotic division. All of these are to be considered as different stages of the lymphoid cells described in the periphery of the granule. Between these formations can be seen a moderate number of larger elements with oval or round, pale and homogeneous nuclei containing one or two nucleoli. These are three or four times as large as most of the cells in the centre of the granule and may be distinguished by their protoplasm. Some are in the stroma, some are irregularly stellate and touch the connective-tissue fibres only with their processes, others are provided with long, slender processes of protoplasm which extend far from the cell bodies. Certain of these contain in the protoplasm corpuscles which are so strongly stained by hæmatoxylin that their color is not to be distinguished from that of the karyokinetic figures found in the lymph cells of the neighborhood. These corpuscles are of various shapes and always surrounded by a little clear zone. These large cells, with corpuscles or not, are present in considerable numbers in very young granules and become less numerous later. The presence of transitional forms indicates that these cells belong genetically with the stroma. The cells with large processes of protoplasm seem to be fixed connective-tissue cells which have greatly increased in size and thereby become separated from the stroma. They are identical with Villard's phagocytes and large cells and with Leber's corpuscle cells. They are found in trachoma granules and in normal lymph nodules.

Trachoma granules do not differ in structure from the normal lymph nodules found in other mucous and serous membranes. The trachomatous process is characterized by the peculiar development and retrogression of the lymph nodules. Lymph nodules normally found in mucous and serous membranes have no certain form and their presence is transient. According to Fleming and Marchand they start in circumscribed places wherever and however the lymphoid elements begin to proliferate. It is not necessary that a physiological nodule should precede the trachoma granule, and therefore it is superfluous to search the normal conjunctiva for a physiological basis from which the granules should develop.

II.—DEVELOPMENT OF THE TRACHOMA GRANULE.

The clear innerspace of a trachoma granule somewhat larger than those just considered possesses all the characteristics of the central part of a lymph nodule. It is composed of lymphoid elements which are roundish or flattened by pressure and contain large nuclei, a fairly large number undergoing karyokinesis. Blood-vessels which were absent in the initial granules are now present. The stroma is obscured by the density of the cells. The periphery contains smaller elements than the innerspace with a much greater number of granular and intensively stained nuclei than in the initial granules, but they are not so densely packed as conceal the stroma, which blends with the connective tissue of the neighborhood and is provided with fixed cells.

In a still more advanced stage the central part is very large in comparison with the marginal zone, which has shrunk to a thin dark shell, the same as that about a lymph nodule. The surrounding connective tissue forms no capsule and has no immediate relation with either the lymph nodules or the trachoma granules. In the stage of involution the trachoma granules are surrounded by fibre cells, but this is a cicatricial formation, not a capsule.

There are numerous divisions of the nuclei in the clear innerspace. The large connective-tissue cells are farther apart and nearly all contain the corpuscles described above, which seem to have increased in number and are of various sizes. Together with these can be found in some cells little hollow spheres the walls of which are formed from three intensively and evenly stained symmetric shells separated from each other

by transparent interspaces. Often the segments are two hemispheres separated by an equatorial transparent zone. Both forms resemble the condition described by Arnold as degenerated nucleus segmentation or fragmentation of the nuclei of lymphoid cells in acute hyperplasia of the lymphatic glands. Probably they are nuclei undergoing destruction and the so-called corpuscles are remains of such nuclei. This idea is supported by the presence of transitional forms. The large connective-tissue cells usually contain more corpuscles in fully developed lymph nodules than in smaller ones, and cells which contain two nuclei may easily be found with one nucleus enlarged and containing corpuscles. The condition up to a certain point is that of a polynucleated cell in which one or more of the nuclei are undergoing destruction. Such cells may be found with two nuclei or with none at all.

In addition to the above there is to be found a small number of cells elongated and irregular in form which contain very little protoplasm, but several pale, homogeneous nuclei, each with a nucleolus. They seem to be connective-tissue cells and probably form a stage in the development of the large connective-tissue cells just described. The polynucleated cells described by Langhans could not be found, but there were present conglomerates of cells which might have been mistaken for them. The large connective-tissue cells also contain a large number of brownish-yellow pigment granules of varying size, such as were found by Fleming in lymph nodules.

Trachoma granules possess a moderate number of blood capillaries with simple endothelial walls, but no lymph vessels. In the periphery of small granules and of small lymph nodules, there were spaces filled with lymph cells which surrounded a great part of them so regularly as to resemble vessels, but the absence of a true endothelial wall proved them to be lymph channels.

In the developed granule, usually at its periphery, are a certain number of cells staining with gentian, which cannot be distinguished from the plasma cells found in the submucous tissue. Finally some cells undergoing necrosis are not rarely met with among the lymphoid elements.

The part taken by the epithelium, the submucous connective tissue, and the adenoid layer of the conjunctiva in the pathological process demands mention. When the granules are very

small, placed deeply, and protrude little if at all, the epithelium usually takes no part. The medium-sized granules carry on their free surfaces a delicate layer of adenoid tissue and epithelium, both permeated more or less by leucocytes. Over very large granules, this layer is thin and flattened. The submucous connective tissue is sometimes normal, sometimes infiltrated, as the trachoma is not, or is associated with secondary inflammatory changes. In many cases the adenoid layer of the conjunctiva is normal, but often it is changed, the changes varying from simple thickening to an energetic papillary proliferation. The latter is met with frequently in most mucous membranes and is due to diverse pathological causes. The presence of trachoma granules predisposes the mucous membrane to papillary proliferation in the same way as many other forms of irritation, and this in turn becomes a complication of the pathological process. Anatomical examination of cases of so-called papillary trachoma and of papillary proliferation in blennorrhœa reveals the same type of disease and no trachoma granules. In the mixed form of trachoma the granules lie each between the bases of two papillæ so that a part of its periphery is covered only by epithelium and a thin adenoid layer, a condition of importance in the explanation of the retrogression of the granules in this form.

III.—RETROGRESSION OF THE TRACHOMA GRANULE.

The surface of a large granule is usually covered by a thin layer of adenoid tissue and flattened epithelium. Its centre is permeated by regularly arranged spaces due to the necrosis and atrophy of many large connective-tissue cells. That they are due to this necrosis and atrophy is proved by the facts that most of these spaces have the same size, form, and arrangement as the spaces in the periphery which still contain such cells, that in some spaces a large cell may be seen undergoing necrosis, and that many corpuscles are to be found free among the lymphoid elements which occupy the centre. The lymphoid elements are, as a rule, well preserved, with an occasional small group undergoing coagulation necrosis. Often there is extensive softening in the centres of large trachoma granules and the capillaries of such granules often have thickened, homogeneous walls, but these changes are neither constant nor equally well marked throughout.

Near such granules are others of the same size which have ruptured so that portions of their contents protrude, while the

parts remaining within form lines toward the opening which continue directly out. This condition must be the result of a traumatism, such as rubbing the lids, which has ruptured and partially evacuated the granules. In the larger granules the rupture is favored by the partial necrosis, but medium-sized granules which are not softened at all also rupture, probably as the result of abrasions of the altered epithelium. In trachoma associated with papillary proliferation the granules rupture where they approach the surface between the bases of the papillæ.

Ruptured granules gradually empty themselves and collapse. The spaces thus formed, which communicate with the outer surface, become granulating and vascular and heal as open wounds by secondary intention, without a stage of acute ulceration. A new formation of connective tissue develops about and between the vessels which surround the granules, particularly from the adventitia. In the beginning of the process of restoration a rich proliferation of fine spindle cells about the vessel walls can easily be seen. These bundles of spindle cells often radiate about the periphery of granules which at first appear to be well preserved, but a careful examination always reveals a solution of continuity, or partial necrosis. Hence the process of repair begins pretty early. The proliferation gradually advances in the surrounding adenoid layer, there is a rapid new formation of fixed connective-tissue cells which finally become more numerous than the lymphoid cells, an intermediate substance gradually appears, and the process goes on to complete cicatrization, which ends the retrogression of the trachoma.

Trachoma may therefore be considered to be a chronic inflammatory process due to a specific cause, which appears in foci and is characterized by the new formation of lymph nodules, which atrophy in consequence of partial necrosis and more or less complete evacuation, and induce a new formation of connective tissue with consequent cicatrization in the adenoid layer of the conjunctiva.

IV.—BACTERIOLOGICAL INVESTIGATIONS.

Addario here describes the culture materials he has employed, and the various micro-organisms he has found in material taken from cases of trachoma. Nothing characteristic was found.

II.—CONTRIBUTIONS TO THE PATHOLOGICAL ANATOMY OF
HÆMORRHAGIC DISEASES OF THE RETINA.

By DR. G. ISCHREYT, RIGA,

I.—THROMBOSIS OF A BRANCH OF THE CENTRAL VEIN OF THE
RETINA WITH SUBSEQUENT GLAUCOMA.

One morning a man noticed an opacity before his right eye, which had previously been healthy. It appeared like a large ink spot that lay centrally on every object on which the eye was fixed. Fingers could be counted, but reading was impossible. Two months later a severe pain attacked the eye during the night and the fundus became invisible. Two days later the eye was enucleated for absolute hemorrhagic glaucoma following thrombosis (?) of the central vein of the retina.

Anatomical investigation revealed an extensive obliterating endarteritis, a localized phlebitis, venous hyperæmia, and thrombi in both arteries and veins. The hæmorrhages were partly of arterial, partly of venous origin, and were due in a general way to degeneration and faulty nutrition of the vessel walls.

II.—SEPTIC RETINITIS OF ROTH.

A woman twenty-four years of age, with no family history of hæmophilia, came under observation Nov. 11, 1898, and died Nov. 26th, of acute leucæmia. She had ecchymoses on the back and breast and signs of a hæmorrhagic diathesis on the gums. It was difficult to check the bleeding from a puncture, or a spontaneous nosebleed. The blood was very fluid and showed a disinclination to coagulate. The hæmoglobin on entrance was 40 %, but sank later to 25 %. On Nov. 11th there were two hemorrhages in the retina of the left eye and a plaque, but no hemorrhages in that of the right, and there was nothing to be noted about the papillæ. On Nov. 23d the papillæ were very pale, there were large and small, old and recent hemorrhages above and below both papillæ, partly covering the vessels and, in the region of the macula, interspersed with white patches of retinal degeneration, and at the posterior poles the retinae were grayish or grayish red. No bacteria were found by the microscope. The central artery and vein were normal. There were no hemorrhages in the optic nerve, except in its intraocular portion. In the layer of nerve fibres the vessels were in general normal, nowhere distended or occluded by emboli or thrombi. The nuclei

of the endothelium were well stained, sometimes large, and protruding into the lumen in places sufficiently to block it. In places the walls were interrupted and allowed the escape of hemorrhages. Where the nuclei of the endothelium blocked the canal and there was no rupture, the surrounding tissue was œdematous. The hemorrhages were mostly in the layer of nerve fibres and in the ganglion-cell layer. The choroidal arteries were collapsed, the veins full, but not distended. In the choroid there was a little cellular infiltration. The ciliary vessels were normal. There was nothing of importance in the ciliary body, iris, cornea, or lens.

III.—BLACK OPTIC NERVES.

BY DR. L. PICK, KÖNIGSBERG.

A girl seven years old was brought to the clinic on account of hemorrhagic retinitis. There was no cyanosis of the eyeball, the irides were greenish-gray, and the eyes were outwardly normal except for a convergent strabismus of the left. The left eye was highly myopic and amblyopic. The papilla was surrounded by a large mass of opaque nerve fibres. In the middle of the papilla was a dark brown, almost black, discoloration varied only by the red of the blood-vessels. The pigment was not compact, but was arranged in a radiating manner. About this black centre was a ring of white tissue, about this a slightly pigmented zone, and about this was the mass of opaque nerve fibres. The rest of the fundus appeared to be normal.

IV.—COLOBOMA OF THE OPTIC NERVE.

BY DR. TERECHKOWITSCH, MOSCOW.

A girl, fifteen years old, was operated on for a soft cataract which had developed in an eye that had previously possessed poor vision and had squinted. After the operation a coloboma of the optic nerve could be seen.

V.—CONTRIBUTIONS TO THE ANATOMY OF SECONDARY GLAUCOMA.

BY DR. A. SACHSALBER, GRAZ.

The histological conditions found in five eyes with glaucoma

secondary to perforating processes of the cornea, with corneal staphyloma and scleral ectasia, were as follows :

First Eye.—The surface of the corneal staphyloma was covered by several layers of epithelial cells—cylindric, cuboid, and flat. There was no uniform demarcation between the epithelium and the basal membrane, but the former sent irregular processes into the subjacent cicatricial tissue. Vessels were fairly numerous in the peripheral portions of the scar, but were scarce in its central part. Half a millimetre from the surface was a second layer of scar tissue, poorer in nuclei. Between these two layers was a layer of what has been termed, by many authors, products of degeneration. The deepest layers of the staphyloma consisted of corneal lamellæ and Descemet's membrane with its endothelium. The anterior chamber was present only in the middle ; laterally the iris was adherent to the cornea. Descemet's membrane was very thick, and a similar thick hyaloid layer passed over to the anterior surface of the iris, which regained its normal thickness at some distance from the place where it was adherent to the cornea. In many places the endothelium was much proliferated. Descemet's membrane extended in the scar tissue in close relation to the posterior pigment layer of the iris, even as far as the beginning of the conjunctiva bulbi. Schlemm's canal was absent. The anterior ciliary veins were large and their walls were much thickened. In the free portion of the iris the peripheral part of the basal membrane beneath the endothelium was much thickened ; otherwise the tissue had a normal appearance on the whole, except for scattered inflammatory foci. The margin of the pupil was bound to the anterior capsule by posterior synechiæ. The sclera was very thin and contained products of degeneration. The ciliary body was flattened, chiefly at the expense of the reticular connective tissue, while the muscle retained nearly its normal dimensions. The ciliary processes were very atrophic, the superficial epithelium proliferated. Toward the ora serrata, a very cellular tissue, containing hyaloid deposits and granular light-brown pigment arranged in lines, lay on the epithelium. In the choroid there were various changes. In many places the membrane was very thin and the perichoroidal lymph spaces obliterated. The latter were also extensively adherent to the sclera, and in other places contained large plates of endothelial cells. In the stroma were numerous collections of round cells, some large, but mostly small. In the larger veins were

circumscribed thickenings of the endothelial layer. Within the endothelium, karyokinetic figures were present. There was endophlebitis of the vortex veins, the endothelial layer was much thickened and presented pearl-shaped masses which caused obliteration. The perivenous lymph spaces were almost completely filled by a thick endothelial layer and contained many detached endothelial cells. These changes were common to all four vortex veins. The optic nerve was totally excavated, the lamina cribrosa was rarefied and pressed backward, the optic fibres in great part atrophic, the interstitial tissue, as well as that about the vessels, proliferated and rich in nuclei. The ganglion cells of the retina were diminished, Mueller's fibres proliferated. The pigment epithelium, the capillaries, and the middle vessel layer of the choroid were atrophied about the papilla.

Second Eye.—The cornea was large and very thin. The epithelium was normal. Bowman's membrane showed dehiscences which were filled with epithelium and allowed some protrusion of the substantia propria. At one place it was wanting, and the stroma was replaced by cicatricial tissue. Elsewhere the membrane was preserved, but permeated by nuclei resembling those of connective tissue. The parenchyma of the cornea was normal. Descemet's membrane was largely absent, so the stroma came into immediate contact with the iris and its pigment epithelium. The tissue of the iris was very thin and consisted mainly of a layer of very cellular cicatricial tissue on which lay the pigment epithelium. A peculiar configuration was afforded by the union of the iris and its pigment layer with a new formation of connective tissue $2\frac{1}{2}$ mm behind the wall of the staphyloma so as to form a cone, the base of which was formed by a thick layer of very vascular connective tissue, rich in nuclei and containing numerous pigment cells. This layer pointed backward and finally ended in a cord formed of pigment cells which blended with the new formation. The anterior ciliary vessels were much dilated. The iris was totally adherent to the ectatic cornea; the ciliary body was flattened and the ciliary processes drawn out by the shrinking exudate. The epithelium of the ciliary processes was proliferated. The membrane which served to separate the anterior and posterior segments of the globe was composed of the ciliary processes, the fibres of the zonula, and some cortical fibres of the lens, with between them a vasculo-cellular connective tissue. The retina was detached at the ora serrata.

There were no signs of degeneration in the wall of the staphyloma or in the iris. The choroid was greatly thinned, most of its vessels obliterated. The suprachoroidea had disappeared. The stroma was replaced by a uniform layer of connective tissue with few vessels, permeated by numerous cells with and without pigment. There was periphlebitis of three of the vortex veins, with proliferation of the endothelium of the lymph spaces about them, but proliferation of the endothelium of the veins themselves could be found only occasionally. About the fourth vortex vein there were no such changes, and even the neighboring choroid appeared almost normal. The retina was in pretty good condition with large vessels and some fresh hemorrhages, the basal tissue proliferous or in some places wanting, the ganglion cells diminished. The papilla was excavated to its margin, the lamina cribrosa rarified and pressed back, the nerve fibres atrophic, the interstitial tissue proliferated and containing fatty degenerated cells.

Third Eye.—The wall of the staphyloma was folded and irregular, the thickness uneven. The epithelium was normal. The scar tissue was very cellular and vascular. The deeper layers were compact and poor in cells, though containing nests of cells here and there as well as scattered pigment cells. The posterior surface of the staphyloma was covered with pigment, but there was no iris structure in the posterior layers of the scar. The most peripheral part of the iris could be separated with difficulty from the cicatrix. There was no degeneration in the wall of the staphyloma. The conjunctival, ciliary, and episcleral vessels were distended in the scleral zone, and more peripherally on the sclera. The ciliary body and processes were stretched out, the former flattened. The choroid was thin and contained few vessels, but in many places dense connective tissue, and was in places adherent to the sclera. All the vortex veins were smaller than normal, the lumen diminished, the walls thickened. One was obliterated. The perivenous lymph spaces had disappeared. The retina was hyperæmic, its vessels distended. The ganglion cells were mostly lost, the granular layer well preserved, the layer of rods and cones irregularly arranged. Müller's fibres were proliferated and thickened in some places, in others they were absent. The papilla was totally excavated, the nerve fibres atrophic, and the interstitial tissue proliferated with many fatty granular cells.

Fourth Eye.—This eye was enlarged in all meridians. The epithelium on the staphyloma was horny on its surface, but more deeply it was composed of larger succulent cells between which penetrated net-like processes from the horny layer. In a few places it was separated from the subjacent tissue. The cicatricial tissue was very firm with few nuclei. Beneath the epithelium was a not very deep zone of degeneration. In the deeper part of the wall of the staphyloma the corneal tissue was largely preserved, and Descemet's membrane appeared normal. The iris was everywhere adherent to the cornea, the tissue torn in many places, but the pigment coat never absent. The scleral zone was thin, the vessels distended with blood. The ciliary body was flattened, the muscle tissue diminished as well as the reticular connective tissue, the ciliary processes drawn out, atrophic, and covered with normal epithelium. The choroid was atrophic, the suprachoroidea changed to a dense connective tissue with quantities of pigment and adherent to the sclera. The endothelium of the vortex veins was not markedly proliferated, but the lymph spaces about them were narrowed by proliferation of the endothelium, the vessel walls were thickened, and the lumen of the veins was greatly diminished. One vein was obliterated.

Fifth Eye.—The eyeball was markedly enlarged. The wall of the staphyloma had a very irregular epithelial coat which penetrated in places into the scar tissue and in other places was very thin. From the superficial layer of flat cells nets with cuboidal cells having large bodies of protoplasm in their meshes penetrated the deeper layers. The epithelium was detached from the subjacent tissue. There were also epithelial nests separated from the superficial epithelium by a layer of connective tissue. Below the epithelium was a layer which presented various signs of degeneration. In the middle layer of the wall of the staphyloma these signs became less important and in the posterior layer had disappeared. Descemet's membrane was present in some places, absent in others. The iris was adherent to the thin wall of the staphyloma. The thickness of the iris was very uneven, it was frequently adherent to dense layers of newly formed connective tissue situated more deeply in the eye by means of pigmented cords. The transition into the ciliary body was not well defined, the ciliary body itself was flattened, the muscular fibres partially atrophic, the reticular connective tissue absent. The ciliary processes were involved in a very cellular cicatricial tissue

which formed a thick membrane between the anterior and posterior segments of the eye. The anterior ciliary vessels, particularly the veins, were much dilated. The entire space between the staphyloma and the above-mentioned membrane was filled with blood. There were many extravasations in the ciliary body and in the membrane. The vessels of the conjunctiva, sclera, and staphyloma were distended with blood. There was a cellular infiltration of the choroid which contained many extravasations. The condition of the vortex veins could not be demonstrated because of the hemorrhage, but there were signs of an occlusion of the perichoroidal lymph space and an agglutination between the sclera and choroid. The papilla was totally excavated. There was proliferation of connective tissue in all the layers of the retina, particularly in the layer of nerve fibres. The granular layer and the layer of rods and cones were torn by numerous extravasations. Ganglion cells were absent.

The most important point demonstrated was the close anatomical resemblance between primary glaucoma and secondary glaucoma with the formation of corneal staphyloma. The changes in the vortex veins and the perivenous lymph spaces are the same in each.

VI.—THE ANATOMICAL BASIS OF ALCOHOL AMBLYOPIA.

BY DR. A. SIEGRIST, BASLE.

Siegrist removed both eyes from the fresh cadaver of a man who had died of carcinoma of the stomach, for the purpose of obtaining some sections of a normal fovea, and found an unexpected condition which corresponded closely with the descriptions already published of that produced by alcohol poisoning.

VII.—THE POSSIBILITY OF AN OBJECTIVE DEMONSTRATION OF COLOR-BLINDNESS.

BY DR. G. ABELSDORFF, BERLIN.

Abelsdorff has observed the reactions of the pupils when the eyes were illuminated with light which had passed through red, green, yellow, and blue glass, and has found that in persons with normal color-sense the pupils are smaller in red light than in green or yellow, and smaller in yellow than in blue. In a protanope, or a person with red-blindness, the pupils were smaller in green light than in red, smaller in yellow light than in red, and

smaller in yellow light than in blue. The first two conditions were the opposite to those found in persons with normal color-sense, the third was the same. In a deuteranope, or person with green-blindness, the reaction of the pupils was the same as in persons with normal color-sense, smaller in red light than in green or yellow, smaller in yellow light than in blue. In total color-blindness the pupils were smaller in green light than in red, smaller in yellow light than in red, and smaller in blue light than in yellow—all of these reactions the opposite to those met with in the normal. In pseudo-monochromasia, false total color-blindness, and in hysterical total color-blindness the reactions of the pupils were the same as in the normal.

VIII.—PARALLACTIC AND PERSPECTIVE DISPLACEMENT IN THE
RECOGNITION OF DIFFERENCES OF LEVEL, OR IN
MONOCULAR PROJECTION.

BY DR. M. REIMAR, BRUNSWICK.

This article deals with the explanation of the manner in which differences in the level of objects seen in the fundus of the eye when viewed with the ophthalmoscope are recognized by their parallaxic and perspective displacement. It relies extensively on the diagrams which accompany the text, and, like most articles of its class, cannot be well presented in an abstract.

IX.—SUBJECTIVE ASTIGMOMETRY BY CERTAIN OPHTHALMOMET-
RIC METHODS OF DUPLICATION, PARTICULARLY BY
KAGENAAR'S BIPRISM.

BY DR. S. HOLTH, CHRISTIANIA.

This article is on the relative merits of the Wollaston prism, used in the Javal-Schiotz ophthalmometer, and the biprism used by Kagenaar in the construction of his instrument.

X.—TWO CASES OF INJURY TO THE OPTIC NERVE.

BY DR. CASPAR, MÜHLHEIM.

1. A man twenty-three years old was struck on the left eye by a piece of iron about as long and thick as a finger. The vision was completely lost for a short time but was partially regained. Five days after the injury there was an uninflamed wound of the conjunctiva, 2 or 3mm above the limbus of the cornea, which

seemed soiled by many black particles. Beneath the conjunctiva in its neighborhood were many black granules. The pupil was rather irregularly dilated and reacted slowly. Otherwise the external appearance of the eye was normal. Its movements were unrestricted. The lens appeared normal. In the posterior part of the vitreous were some little black floating opacities. The papilla was somewhat reddened and, together with its immediate neighborhood, slightly hazy. About its margin there was a circle of blood clots, most numerous and largest below, while above and to the right there were several groups of hemorrhages, most of which lay on the retina and extended into the vitreous. A very large hemorrhage lay above at some distance from the papilla. The veins were somewhat dilated, the arteries normal. In and about the macula the retina presented a whitish gray opacity, the typical appearance of commotio, horizontally oval, about six times the size of the papilla, sharply defined only toward the optic nerve, which it approached to within 1 p.d. The upper half of the field was completely defective, including the point of fixation, with a sharp, almost horizontal margin. Elsewhere the vision was $\frac{1}{10}$. The hemorrhages became gradually absorbed, and about three weeks after the injury signs of a partial atrophy appeared in the upper part of the papilla (inverted image). No change took place in the field, and the margin of the defect was very sharply defined. The excentric vision became $\frac{1}{2}$. Nine months later the atrophic portion of the nerve was white, with gray spots and deeply cupped. The probable diagnosis was a laceration of the lower part of the optic nerve at a short distance from its entrance into the eyeball, not involving the central vessels.

2. A man thirty-six years of age was shot in the left eye. Twenty-four hours later there was considerable saggillation of the lids, a punctured wound in the upper lid 5mm above the outer canthus, and much blood beneath the ocular conjunctiva on the temporal side. The pupil was moderately dilated and fixed. The movements of the eye inward were abolished, outward and upward much restricted, downward good. Ophthalmoscopic examination negative. The vision was reduced to the perception of movements of the hand a few feet away in the upper portion of the field alone. The tension was normal, there was no protrusion, and sensitiveness about the eye was the same as about the other. The next day the patient could count fingers, and a

large sector-shaped defect in the lower portion of the field could be made out with fair accuracy to involve perhaps a third of the normal field, including the point of fixation. The motility of the eye was about the same. The pupil was small and did not react. Ophthalmoscopic examination negative.

From these data the writer concludes that the shot passed close above the external rectus in a direction backward and inward and either ricocheted across the apex of the orbit or took a course more in the sagittal plane of the skull. In either case it went between the superior rectus and the optic nerve, wounding the latter, and imbedded itself near the origin of the internal rectus, probably wounding the branch of the oculomotorius which supplies this muscle. He thinks the rigidity of the pupil may have been caused by an injury of the motor root of the ciliary ganglion, though such an injury is not indicated by the good motility of the eye downward.

The patient finally recovered, with normal motility, vision $\frac{5}{8}$ with—4 D., and no diplopia. The optic nerve looked atrophic, with sharp margins and not cupped. The retinal vessels were normal. The field of vision was slightly contracted and there was a small scotoma for green and red just below the fixation point.

XI. — ISOLATED SPOTS OF OPAQUE NERVE FIBRES IN THE RETINA.

BY DR. CASPAR, MÜHLHEIM.

1. Female, seventy-two years old. A small triangular spot $\frac{1}{3}$ p.d. to the temporal side of the optic nerve (inverted image), with its apex directed toward the nerve. The apex was snow-white, the rest yellowish and finely striated, the striations tending toward the apex. Its margins were distinct centrally, but not distally. Papilla normal. Vision $\frac{5}{8}$.

2. Male, twenty-seven years old. In the upper-outer part of the left retina (inverted image) was a spot 3 p.d. long, 1 p.d. broad, snow-white with yellowish margins, in which the course of the fibres corresponded with the course of the retinal fibres. It began 1 p.d. from the papilla, which was normal in appearance, and extended along the course of the inferior nasal artery and vein, covering them in places.

3. Male, eighteen years old. About 5 or 6 p.d. inward

and a little upward from the right optic nerve (inverted image was a bright rhomboidal spot, its long diameter directed toward the papilla. Its middle was whitish, its margins, especially at the) distal end, reddish yellow, its fibres parallel to its long diameter. Small blood-vessels dipped into it here and there. Papilla normal. Vision 1.

4. Male, thirty-five years old. Two small spots of opaque nerve fibres 3 p. d. to the temporal side of the optic nerve (inverted image). The area of each respectively was about $\frac{1}{4}$ and $\frac{1}{5}$ that of the papilla. Color yellowish and reddish. They were finely striated longitudinally and their margins were not very distinct. Blood-vessels passed over them. The papilla appeared to be normal. Vision 1.

XII.—BACTERIOLOGY OF FOLLICULAR DISEASES OF THE CONJUNCTIVA.

BY DR. D. GROMAKOWSKI, KIEW.

Gromakowski divides his cases into four groups: the first contains those in which follicles with chronic hyperæmia of the conjunctiva were present only in the retrotarsal folds; the second those in which follicles were also present in the tarsal conjunctiva and the disease presented a very chronic character; the third those in which the formation of follicles was acute; the fourth those of trachoma with more or less thickening of the conjunctiva, many follicles, and a muco-purulent secretion.

In the first class he found no specific micro-organism, those which were present he considered purely accidental.

In the second class, no micro-organism could be found in the contents of the follicles or in the tissue of the conjunctiva. When secretion was present, white staphylococci and pseudo-diphtheritic bacilli could be found in it.

In the cases of acute follicular conjunctivitis, small bacilli, similar to the Koch-Weeks, were found in 8, pseudo-diphtheritic bacilli in 2, micrococci tetragenes, micrococci flavi liquefaciens, and pseudo-diphtheritic bacilli in 1.

In 42 cases of the fourth class, small bacilli, similar to the Koch-Weeks, were present in 15, white staphylococci and pseudo-diphtheritic bacilli in 17, streptococci in 2, pneumococci in 1, micrococci tetragenes in 1, and no bacteria, aside from the pseudo-diphtheritic bacilli, in 5.

XIII.—TWO REMARKABLE CASES OF FRAGMENTS OF IRON IN THE ANTERIOR PART OF THE EYE.**BY DR. E. GLAUNING.**

In the first case, a man was sawing wood and was struck, as he thought, by a splinter of wood in the eye. The produced irritation subsided, but eighteen months later a severe inflammation began, which resulted in the discovery of a foreign body in the anterior chamber, which after removal proved to be a piece of iron. The patient recovered.

In the second case, a boy was struck in the eye with, as he said, a pencil. The eye became severely inflamed, and three weeks later a wound was found above the cornea and a track leading toward the anterior chamber. This was laid open until a foreign body was met with and removed. It proved to be the point of a steel pen.

XIV.—THE NUCLEAR ZONE OF THE LENS IN BIRDS.**BY DR. C. RITTER, BREMERVOERDE.**

An excellent contribution to the study of comparative anatomy.

XV.—A CASE OF PROLAPSE OF THE RETINA THROUGH A CENTRAL FISTULA OF THE CORNEA, WITH PHTHISIS BULBI OF TRAUMATIC ORIGIN; ENUCLEATION; ANATOMICAL AND MICROSCOPIC EXAMINATION.**BY DR. ADAM BEDNARSKI.**

A man thirty-three years old had his left eye injured a year before by being struck with a stone. The left eyeball was small. There was considerable conjunctival and ciliary injection. The cornea was flattened and slightly cloudy. In its centre was a fistula from which protruded a gray, fibrous mass. Close behind the cornea was a muddy, reddish-gray reflex. No anterior chamber, pupil, or iris could be seen. Tension — 2. Vision 0.

After the eye had been enucleated, a section in the vertical meridian through the middle of the fistula and the papilla showed the following picture: In the centre of the cornea there was a fistula, 1.5 mm in diameter, which ran rather obliquely upward and backward. The anterior chamber was absent. The iris lay in close apposition to the cornea. Behind the iris and be-

low the fistula lay the remains of the lens. The anterior part of the lower portion of the globe was occupied by a blood clot which lay between the choroid and the detached retina. A portion of the retina protruded through the fistula, and the continuity of the prolapsed portion could be plainly seen and traced to the entrance of the optic nerve. Both retina and choroid were detached from the sclera in the upper part of the globe. No foreign body was found.

The microscopical examination confirmed the diagnosis of prolapse of the retina through a central fistula of the cornea.

**XVI.—REMARKS ON THE POSITION OF PROF. HESS REGARDING
CONGENITAL CYSTS OF THE EYE AND THEIR ORIGIN.**

BY DR. **GINSBERG**, BERLIN.

This is a purely controversial article.

XVII.—EXCISION OF THE RETROTARSAL FOLD IN TRACHOMA.

BY DR. **MARCZELL FALTA**, SZEGED.

Falta states that 20% of his ophthalmic patients in Hungary have trachoma, and that he successfully treats most of the non-acute cases by rubbing with sublimate. But some cases will not respond to such treatment, and in such he performs Kuhnt's operation of excision of the retrotarsal fold. He ascribes the usefulness of the operation not to the formation of a dam by the cicatrix to the extension of the disease to the ocular conjunctiva and the cornea, but to the modification of the circulatory conditions effected, and believes that it exerts not a passive but an active influence on the course of the disease. The upper fold alone should be excised. The only modification which he makes to Kuhnt's procedure is in the management of the sutures, which has presented some difficulties. Some surgeons have left the wound unsutured, but this he does not consider wise. If the sutures are cut short they are hard to remove without injury to the wound, while if left long they have been found apt to rub against the cornea and cause ulceration. The method he employs is to cut one end of each suture close to the knot and to carry the other end out through the inner or the outer canthus and secure it to the skin with plaster. In this position the long threads cannot rub the cornea, while the opportunity is afforded

to remove them at the proper time without danger of reopening the wound by eversion of the lid.

**XVIII.—SOME MODIFICATIONS OF MY APPARATUS FOR THE
DIAGNOSIS OF COLOR-BLINDNESS.**

BY DR. WILIBALD A. NAGEL.

Uniformity of the color-fields has been attained by the addition of two finely ground glasses, one placed just behind the shutter, the other just in front of the removable strips of colored glass. The large tin funnel of the original apparatus has been replaced by a short cylinder to which is appended a circular movable disc. The base of the apparatus has been made lighter, thus making the instrument more manageable. One yellow, one green, and two red glasses have been added. The instrument is used in the same way as the original.

REPORT OF THE PROCEEDINGS OF THE OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

BY MR. C. DEVEREUX MARSHALL.

THURSDAY, JANUARY 25, 1906. PRIESTLEY SMITH, F.R.C.S.,
PRESIDENT, IN THE CHAIR.

Mr. SIMEON SNELL (Sheffield) related a case of **septic thrombosis of the cavernous sinus**. On May 1, 1895, a medical man pricked a small vesicle on the upper lip with a gold scarf pin which had been used previously to open an abscess, and which was thought to be clean. The next day there were redness and swelling, and later on that day he was obliged to go to bed. On the 5th the condition of the lip was worse and the blush extended to the left cheek and orbit. This was followed by proptosis and swelling of the conjunctiva and eyelids. Later the right side followed the same course, the proptosis being even more marked on this side. The movements of the eyeballs were interfered with and there were paralysis of the right facial nerve and deafness on the right side, also dulness and evident effusion of the right side of the chest. The patient died fourteen days after the commencement of the illness, his mind having been unaffected throughout.

Mr. Snell remarked that the initial lesion was that on the lip, which the medical attendants had considered to be malignant facial carbuncle. No post-mortem was allowed.

Mr. SNELL also related the case of a pork butcher aged forty-eight who came to him with **acute œdema of the eyelids** on both sides. The day before, he had been dressing a pig, when the gut, which contained a large number of worms, burst and the contents splashed into his face. The œdema was present three or four hours later.

When first seen by Mr. Snell, twenty-two hours later, the eyelids on both sides were intensely œdematous, projecting as large semi-translucent swellings, leaving only a chink between them. There was considerable chemosis of the conjunctiva. The next day the swelling had much subsided, and the day after the condition of the eyelids had almost passed away, though the conjunctiva remained red.

The worms in the pig were the same class as *Ascaris lumbricoides*, and in seeking an explanation for the condition, Mr. Snell mentioned that it had been recorded that these worms, when alive, give off an irritating vapor. From another pig in which worms had collected together, the contents of the gut, and also nutrient broth, into which some of the worms had been placed, after having been cut to pieces, created no irritation when instilled into the conjunctiva of a guinea-pig.

The treatment of detachment of the retina by Mr. A. MAITLAND RAMSAY.

This paper was based on a record of fifty consecutive cases of detachment of the retina, treated in the Glasgow Ophthalmic Institution, during the four years ending October 31, 1905. The active treatment consisted in subconjunctival injections of 5 to 20 minims of 1 in 2000 bicyanide of mercury with 8 per cent. chloride-of-sodium solution, the severe pain that always followed being mitigated by the addition of a few drops of 1 per cent. acoine solution. The injection was repeated as often as might be necessary, at intervals of from four to six days; and if no decided improvement showed itself within a fortnight, free diaphoresis was induced by the subcutaneous injection of from $\frac{1}{8}$ to $\frac{1}{4}$ of a grain of pilocarpine, this alternating with the subconjunctival injections. If the site and character of the detachment were deemed favorable, the subretinal fluid was always evacuated by scleral puncture. The patient was kept prone in bed with his eyes bandaged, and every effort was made to improve his general well-being, by careful attention to diet and to the action of the bowels, kidneys, and skin. Marked chemosis of the conjunctiva was essential, and when the reaction to the subconjunctival injections was absent or ill-marked, 1 to 2 per cent. of dionine was added to the bicyanide and chloride-of-sodium solution. Of the fifty cases treated, ten showed a decided improvement, and thirteen a moderate improvement, though of the former group five, and of the latter group two, relapsed at

intervals varying from two weeks to four years. The more recent the detachment the more favorable the prognosis, but the pathological antecedents of the affected eye were more important than the duration of the condition. Failure was the rule in all cases marked by a seriously degenerated choroid, a pupil sluggish to mydriatics, a much diminished tension, and a red-colored separation. The method of treatment outlined was simple, applicable to all cases, and, as far as the author's experience went, never did any harm.

Dr. D. J. WOOD related a case of **bitemporal hemianopsia**. The patient was a man aged thirty-three who had suffered for over a year with frontal headache, failing vision, and loss of memory. The vision of the right eye was $\frac{1}{80}$ and of the left $\frac{6}{80}$, and there was bitemporal hemianopsia with contraction of the field and loss of fixation in the right. He was mentally dull and forgetful and there was marked delay in answering questions. The pupils were sluggish and the knee-jerks were almost absent. During the fifty-two days he was in hospital he grew worse mentally, and on account of his foul language and filthy habits it was impossible to keep him in. After sixty-two days during which there was little change, he suddenly sat up and began to ask sensible questions, and when seen some months later he was mentally quite well. His right eye showed optic atrophy, was blind and divergent. The left improved to $\frac{6}{18}$, his patellar reflexes were normal, and his memory for events after his sudden recovery was good. He had no recollection of anything during the previous three and a half months. His history was given by his wife, brother-in-law, and mother who all agreed as to the details.

The case was thought to be one of cystic growth of the pituitary body which, during a fit of coughing, had ruptured through the eroded bone and had escaped into the pharynx or nasal cavities, but nothing of this sort was noticed by the friends, and the patient was more or less unconscious until the actual relief from pressure had occurred.

SYSTEMATIC REPORT ON THE PROGRESS OF OPHTHALMOLOGY IN THE FIRST QUAR- TER OF THE YEAR 1905.

By Dr. G. ABELSDORFF, in Berlin; Prof. ST. BERNHEIMER, in Innsbruck; Dr. O. BRECHT, Prof. R. GREEFF, Prof. C. HORSTMANN, and Dr. R. SCHWEIGGER, in Berlin; with the Assistance of Prof. A. ALLING, New Haven; Prof. E. BERGER, Paris; Prof. CIRINCIONE, Genoa; Dr. DALÉN, Stockholm; Prof. HIRSCHMANN, Charcow; Dr. J. JITTA, Amsterdam; Mr. C. DEVEREUX MARSHALL, London; Dr. H. MEYER, Brandenburg; Dr. P. VON MITTELSTÄDT, Metz; Dr. H. SCHULZ, Berlin; Prof. DA GAMA PINTO, Lisbon; and Others.

Translated by DR. MATTHIAS LANCKTON FOSTER.

Sections I.-III. Reviewed by PROF. C. HORSTMANN,
Berlin.

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10. *Contributions to Ophthalmology*. Festschrift in honor of Julius Hirsch-

berg, from his students and friends on the anniversary of his 25th year as Professor in the University of Berlin. Leipsic, 1905, Veit & Co.

11. SALZER, FRITZ. *Guide to Ophthalmoscopy*. Munich, 1905. J. F. Lehmann.

12. WOLFF, HUGO. *The Theory of Skiascopy from the Standpoint of Geometrical Optics, Ophthalmoscopy, and Entoptic Perception (Entopic Theory of Skiascopy)*. Berlin, 1905. S. Karger.

13. DAHLFELD, C. *Pictures for Stereoscopic Use in Strabismus*. 5th edition. F. Enke, Stuttgart, 1905.

14. HAITZ, ERNST. *Tables for the Investigation of the Centre of the Visual Field by Means of the Stereoscope*. Wiesbaden, J. F. Bergmann, 1905.

15. TEICH, M. **First aid in injuries of the eyes.** *Medicinische Klinik*, 1905, No. 26.

16. TEICH, M. **Military oculists.** *Wiener. med. Presse*, 1905, No. 19.

17. MORITZ, M. **Daylight in the schoolroom.** *Klinisches Jahrbuch*, vol. 14. Jena, G. Fischer, 1905.

18. RADZIEJEWSKI, M. **Efficiency of school physicians and investigations of the eyes.** *Zeitschrift für ärztliche Fortbildung*, 1905, No. 5.

19. GOLDSCHMIDT. **An attempt to teach the deaf and blind.** *Deutsche med. Wochenschr.*, 1905, p. 468.

20. DESCHAMPS. **Valuation of injured eyes.** *Annal. d'Ocul.*, cxxxiii., p. 112.

21. RASDELSKY, W. P. **Color-blindness and railroad signals.** *Wjenno-Med. Journal*, 1905, Jan.

22. JACKSON, E. **The relations of ophthalmology to other departments of science.** *Annals of Ophthalmology*, Jan., 1905.

23. MOSSLJANNISKOW, A. J. **The asylums for the blind in the district of Malmysch, 1903-1904.** *Westn. Ophthalm.*, 1905, No. 1.

24. TOLMATSCHEW, D. **Report of the fifth year of ophthalmological activity in the district of Slatoust.** *Westn. Ophthalm.*, 1905, No. 2.

Rarely has a text-book met with such general approbation as this one of FUCHS (1, Text-book of ophthalmology). The best proof of its usefulness is the fact that this (the tenth) edition comes just fifteen years after its first appearance in 1889. In the present edition the most recent advances, particularly in bacteriology, receive fitting mention, and the number of illustrations and notes is correspondingly increased.

Since the first appearance of SCHMIDT-RIMPLER'S (2, Diseases of the eye associated with other diseases) work in 1895, the advance in medical science has been so great as to necessitate a revision of the book for its second edition. Its size is consequently greater, but its value has been much increased as all recent investigations have received consideration.

SALZER (3, The ophthalmology of the general practitioner) gives a brief account of the eye diseases of especial interest to the general practitioner and urges their diagnosis and treatment.

The second half of the second part of the *Pathological Anatomy of the Eye* by GREEFF (4, Text-book of special pathological anatomy) contains the chapters on the lens and the vitreous. After a description of the normal condition of the lens he deals with coloboma lentis congenitum, lenticonus, changes in position and senile changes of the lens, and changes in the lenticular capsule, in the capsular epithelium, and in the ciliary epithelium. Then follow a description of the changes in the lens substance, a review of the different forms of cataract, foreign bodies of the lens, and entozoa. The chapter concludes with the disappearance of and return of transparency to cloudy lenticular masses. In the chapter on the vitreous, after a description of its normal condition, come fissure formation in the vitreous, persistent hyaloid artery, congenital connective-tissue bands in the vitreous, fluid vitreous, and the various forms of opacities and hemorrhages into the vitreous. Greeff does not believe in Leber-Nordenson's fibrillary degeneration of the vitreous, or in Iwanoff's detachment of the vitreous. Then follow regeneration and inflammation of the vitreous, foreign bodies, dense layers of connective tissue, fat, formation of cartilage and of bone, tumors, and parasites.

The second part of the third volume of NAGEL'S (5, Physiology of the senses) work contains from the pen of O. Zoth the movements of the eyes and visual perception, from that of O. Weiss the nutrition and circulation of the eye and its protective apparatus.

In the 91st installment of the Graefe-Saemisch compilation SNELLEN (6, Operations) deals with neurotomy and neurectomy of the ocular nerves, LANDOLT with surgical intervention in disturbances of the motility of the eye.

HESS (7, Pathology and therapy of lens system) has succeeded very well in the difficult task of dealing with the pathology and therapy of the lenticular system which was so very ably presented in the first edition by the late Otto Becker. His treatment of the subject is never inferior to, but sometimes better than that of his great predecessor, with the result that this work may be numbered among the best ophthalmological productions of the past year.

The 12th installment of SCHWARZ'S (8, Encyclopædia of ophthalmology) *Encyclopädie der Augenheilkunde* contains articles arranged alphabetically from Limbus conjunctivæ to Nachstaar-Operation.

The 7th number of WIDMARK'S (9, Communications from the

Charles Medico-Chirurgical Institute at Stockholm) communications from the eye clinic at Stockholm contains from the pen of E. Jorsmark "The muscular system of the human iris, its construction and development."

The HIRSCHBERG Festschrift (10, Contributions to ophthalmology) contains articles by de Lapersonne of Paris, van Duyse of Ghent, Albertotti of Modena, Cirincione of Palermo, Baquis of Livorno, Birnbacher of Gratz, Schwarz of Leipsic, Peschel of Frankfort, Claude duBois-Reymond, Fehr, Kuthe, Ginsberg, Loeser, F. Mendel, Merz-Weigandt, W. Mühsam, A. Moll, Pertscher, Simon Steindorff, and Br. Wolff.

In his *Guide to the Use of the Ophthalmoscope* SALZER (11, Guide to ophthalmoscopy) concisely presents to the beginner the primary principles of the use of that instrument.

HAITZ's (14, Tables for the investigation of the centre of the visual field by means of the stereoscope) tables are used stereoscopically to ascertain the extent of a central scotoma.

TEICH (15, First aid in injuries of the eyes) describes the first aid in injuries of the eyes, chiefly from the standpoint of the general practitioner, the cleansing and disinfection of the conjunctival sac and of the neighborhood of the eye, the instillation of eye drops, the application of ointments, and the bandage.

TEICH (16, Military oculists) urges the appointment of eye surgeons in field hospitals as well as in the reserve hospitals.

According to MORITZ (17, Daylight in the schoolroom), nothing but the presence of a portion of open sky of sufficient size can guarantee to any place the requisite amount of light for the work.

RADZIEJEWSKI (18, Efficiency of school physicians and investigations of the eyes) advocates the appointment of eye physicians to schools.

GOLDSCHMIDT (19, An attempt to teach the deaf and blind) reports a case of deafness and blindness in which teaching was carried on through the sense of touch.

RASDELSKY (21, Color-blindness and railroad signals) advocates that railroad signals should be distinguished not alone by differences in color, but also by a certain number of sources of light, *e. g.*, green should be indicated by the presence of only one light, red by the presence of two or three. In this way the danger of mistakes from a sudden appearance of color-blindness could be avoided.

HIRSCHMANN.

MOSSLJANNISKOW (23, The asylums for the blind in the district of Malmysch) reports regarding 1253 patients, of whom 249 were stationary, 514 were trachomatous, 636 were incurably blind.

HIRSCHMANN.

The entire number of patients with various general diseases treated by TOLMATSCHEW (24, Report of the fifth year of ophthalmological activity in the district of Slatoust) was 42,322, of which 3657, 9%, had diseases of the eye, and 510, 14%, had trachoma.

HIRSCHMANN.

II.—GENERAL PATHOLOGY, DIAGNOSIS, AND THERAPY.

25. STOCK, W. A clinical contribution to the question of the secretion of the aqueous after puncture of the anterior chamber. *Klin. Monatsbl. f. Augenheilk.*, xliii., 1, p. 86.

26. STRAUB, M. Scrofula and dormant tuberculosis in ophthalmology. *Arch. f. Ophth.* lx., 1, p. 145.

27. VOGT, ALFRED. Further experimental and clinical researches regarding the injurious influence of artificial anilin colors on the eye. *Zeitschr. f. Augenheilk.*, xliii., 2, p. 117, and 3, p. 226.

28. HAAS. Are injuries of the eye soiled by ink particularly dangerous? *Wochenschr. f. Ther. u. Hyg. des Auges*, 1905, No. 18.

29. HESS, C. The part played by heredity and disposition in eye diseases. *Med. Klin.*, 1905, No. 18.

30. KOSKE, F. The changes produced by the injection into the anterior chamber of bacteria, yeast, mould fungi, and bacterial poisons. *Arbeiten aus dem Kaiserlichen Gesundheitsamt*, xxii., 2, 1905.

31. ORLOW. Ocular changes in chronic poisoning with secale cornutum and its preparations. *Neurolog. Westnik*, xi., 3 and 4, and xii., 1.

32. ALBRAND, WALTER. Normal pupillary phenomena, with further remarks regarding the changes in cadaveric eyes of man and the lower animals. A forensic ophthalmological study. *Arch. f. Augenheilk.*, li., 1, pp. 267 and 313.

33. HILBERT, R., Violet vision. *Centralbl. f. pract. Augenheilk.*, xxix., p. 134.

34. WESSELY, K. The effect of adrenalin on the pupil and the tension of the eye. *Zeitschr. f. Augenheilk.*, xliii., 4.

35. VOGT, H. The effect of alcohol on the changes of the pupillary reaction. *Berlin. Klin. Wochenschr.*, 1905, No. 12.

36. LOHNSTEIN, R. A method of determining the refraction by means of the inverted image. *Arch. f. Ophthal.*, lx., 1, p. 87.

37. HERTEL, E. Demonstration of intraocular pieces of steel, by means of an improved sideroscope. The influence of metals upon the magnetic needle. *Arch. f. Ophth.*, lx., 1, p. 127.

38. HESS, C. Notes on the investigation of central scotoma. *Arch. f. Augenheilk.*, li., 4, p. 388.

39. BOCK, E. Radium and the eye. *Allgem. Wiener med. Zeitung*, 1905, Nos. 9-12.

40. KNAPP, A. The bacteriological diagnosis of the diphtheria bacillus, especially in conjunctivitis. *Trans. Amer. Ophthalm. Soc.*, 1904.
41. EMMANUEL. Prognosis and treatment of ocular tuberculosis. *Thèse de Paris*, 1905.
42. BURNETT, SWAN, M. The mathematic point of reversal in skiascopy. *Jour. Amer. Med. Asso.*, Jan. 14, 1905.
43. STRUYKEN. Acuteness of vision and of hearing. *Ned. Tydschr. v. Geneesk.*, vol. 1, No. 3, 1905.
44. HOWE, L. The act of winking, and its photographic measurements. *Trans. Amer. Ophthalm. Soc.*, 1904.
45. ROGMAN. Curability of siderosis of the eye. *Annal. d'ocul.*, cxxxi., p. 31.
46. SPRATT, CHARLES NELSON. The use of paraffin spheres in Frost's operation (modified Mules's), with a report of twenty-three cases. *Arch. f. Ophthalm.*, xxxiv., 2, p. 123.
47. MEYER, O. Enucleation of the eyeball under combined local anæsthesia. *Klin. Monatsbl. f. Augenheilk.*, xliii., 1, p. 214.
48. MCKEE. Experimental researches regarding the resorbent peculiarity of dionin. *Klin. Monatsbl. f. Augenheilk.*, xliii., 1, p. 1, 374.
49. COHN, PAUL. Mishaps of intraocular disinfection with iodoform. *Zeitsch. f. Augenheilk.*, xliii., 1, p. 31.
50. HOLDEN, W. A. A case of mind-blindness unique in that the entire medial surface of the occipital lobes and both optic radiations were preserved. *Trans. Amer. Ophthalm. Soc.*, 1904.
51. OGG, T. A. W. A case of acute plumbic encephalopathy followed by muscular paralysis and optic neuritis. *Clin. Journ.*, Nov. 30, 1904.
52. BUCHANAN, LESLIE. Mycoses with special reference to mycosis of the eyeball. *Glasgow Med. Journ.*, Dec., 1904.

STOCK (25, A clinical contribution to the question of the secretion of the aqueous after puncture of the anterior chamber) reports a case in which iridectomy had been performed on account of seclusion of the pupil. After the puncture of the anterior chamber the iris puffed forward; after the iridectomy, it returned to its normal place. The explanation of this occurrence which is given is that, after the evacuation of the aqueous, a large amount of secretion behind the iris drove the latter forward.

According to STRAUß (26, Scrofula and dormant tuberculosis in ophthalmology), the ectogenous origin of phlyctenulæ is indicated by the fact that the percentage of cases which contain pathogenic bacteria in the conjunctival sac is double that of normal eyes, or of eyes which have been irritated in other ways. The pathological microbes were found in much greater numbers in eczematous eyes than in those used for control. The super-

ficial position of the efflorescences also favors their ectogenous origin. The scrofulous forms are to be differentiated by their stubbornness and tendency to recurrence. Clinical observation of the worst cases shows that at least for these tuberculosis may be looked upon as the predisposing cause.

The great number of injuries to the eye by anilin colors, observed in the clinic at Basle, induced VOGT (27, Further experimental and clinical researches regarding the injurious influence of artificial anilin colors on the eye) to institute experiments on rabbits' eyes. These showed that the acid, neutral, and macerated coloring matter as well as their aqueous solutions produced little or no irritation when introduced into the conjunctival sac, while on the contrary the basic coloring matter produced inflammation which often resulted in panophthalmitis. This difference was probably due to the fact that basic coloring material penetrated the cells more easily, and has a marked affinity for the nuclei. The therapeutic indication is tannin which forms an insoluble combination with the basic coloring matter. The conjunctival sac should be thoroughly washed out with a 5- or 10-per-cent. solution of tannin. Irrigations with water or other solutions were unable to check the poisonous action, while all attempts with tannin succeeded. It is recommended that such a solution of tannin should be always kept in readiness in anilin factories, that the proper treatment may be possible at the right time.

HAAS (28, Are injuries of the eye soiled by ink particularly dangerous?) reports two cases of injury of the eye with ink, both of which were without reaction. These show the innocuousness of ink in the wounds of the eye.

HESS (29, The part played by heredity and disposition in eye diseases) mentions as hereditary anomalies of the eyes, colobomata of the iris, choroid, retina, optic nerve, and vitreous, many forms of cataract, abnormal refractive conditions, squint, and reticular opacity of the cornea.

According to the researches of KOSKE (30, The changes produced by the injection into the anterior chamber of bacteria, yeast, mould fungi, and bacterial poisons), the injection of such living bacteria as the *bacillus subtilis*, *bacillus prodigiosus*, *staphylococcus pyogenes aureus*, *bacillus suispestifer*, and the yeast fungi into the anterior chamber, even in very small quantity, produces destruction of the eye, usually from suppurative inflammation. This effect is to be ascribed to an increase of the

bacteria in the anterior chamber and the irritative action of the bacteria cells and of their products of metamorphosis. Dead bacteria and bacteria which had been treated with alcohol and ether produced only transient symptoms of irritation. Also the material produced by bacteria in fluid cultures produced symptoms of inflammation which passed away in a short time without causing injury.

ORLOW'S (31, Ocular changes in chronic poisoning with *secale cornutum* and its preparations) monograph contains a review of the epidemic of ergotism in which ocular changes were observed, the views of the author in regard to those changes, the experimental works regarding the same, the pharmacognosis and pharmacology of *secale cornutum*, the pathological anatomy of ergotism, the methods of experimental and microscopic research, the experiments of the author on animals, and an analysis of the pathological changes in the eyes of animals poisoned by *secale cornutum*. He comes to the following conclusions: The reduction of vision in chronic poisoning with *secale cornutum* depends either on formation of cataract or on functional disturbance of the visual apparatus. The disturbance of the retinal function is not due to disease of the vessel walls or to stenosis of the vessels, but to the immediate action of the poison circulating in the blood. The affection of the optic nerve has the same origin. Cataract is not the result of spasm, or of the immediate action of the poison on the lens substance, but of a disturbance of the nutrition of the lens due to a specific change in the epithelial covering of the ciliary body, and of the posterior surface of the iris.

HIRSCHMANN.

According to ALBRAND (32, Normal pupillary phenomena, with further remarks regarding the changes in cadaveric eyes of men and the lower animals. A forensic ophthalmological study), three different forms of the pupil are to be distinguished after death. Just after death the pupil usually undergoes a gradually increasing contraction as the result of the development of rigor mortis in the musculature of the iris. The rigidity of the dilatator opposes this action, so that the pupil, on the whole, remains larger than during life. This form of the pupil is to be distinguished from that in which the same process of contraction takes place to an extreme degree at the same time, observed in the enucleated eyes of dead animals. The third form of cadaveric pupil is the slight contraction beginning after the first day of

death, usually to be observed with decreasing tension of the eye. To these forms of contraction stands opposed a transient post-lethal dilatation which may very easily be overlooked.

HILBERT (33, Violet vision) observed in a man fifty years old, suffering from influenza, an attack of violet vision which disappeared after 36 hours under the administration of salipyrin. He ascribes the phenomenon to a central cause.

According to the investigations of WESSELY (34, The effect of adrenalin on the pupil and the tension of the eye), if it is desired to induce mydriasis and decrease of tension by instillations of adrenalin alone, it is necessary to use more concentrated solutions than the majority of the older preparations or the 1:1000 solution now in common use. Accordingly, a dilatation of the pupil is only rarely met with, but from three to five instillations of a 1% solution will always produce a maximum degree of mydriasis and a slight reduction of tension.

According to VOGT (35, The effect of alcohol on the changes of the pupillary reaction), in healthy men, the pupillary reaction remains intact even in the highest degree of alcohol poisoning. On the contrary, men with congenital impairment of the central nervous system show, under the influence of a very small quantity of alcohol, distinct changes in both the pupillary and other reflexes. Chronic alcoholics exhibit the same symptom. In one case there is a congenital, in the other an acquired, diminution of the power of resistance.

LOHNSTEIN'S (36, A method of determining the refraction by means of the inverted image) method of determination of the refraction is based on the fact that in movements of the convex lens, which produces the inverted image, the image moves in the same direction as the lens. The excursions are larger in weak refraction, smaller in strong.

HESS (38, Notes on the investigation of central scotoma) used in the investigation of central scotoma a series of regularly arranged white discs on a black background, which are rendered momentarily visible by means of a shutter. The observer has to state whether all the white discs uncovered were visible, or whether some were wanting.

According to A. KNAPP (40, The bacteriological diagnosis of the diphtheria bacillus, especially in conjunctivitis), the diphtheria bacillus causes a medium containing dextrin to become red

and coagulate while saccharose is unchanged. The xerosis bacillus produces fermentation with acid production in saccharose, while dextrin remains unchanged, and finally pseudodiphtheria bacillus affects none of the sugars.

ALLING.

BURNETT (42, The mathematic point of reversal in skiascopy) points out that, in order to have a movement "against" in skiascopy, the image of the bright spot on the fundus must be formed in front of the nodal point, and in motion "with," back of the nodal point. The place of reversal therefore is at the nodal point. He finds no justification for the use of the term "retinoscopy," yet the word "skiascopy" which he himself uses is not free from objections, because one should not use the shadow but the central reflex especially with wide pupil.

ALLING.

HOWE (44, The act of winking and its photographic measurements) has been able to measure, by photography, the time required for winking. Under normal conditions, winking occupies from 0.4" to 0.5". It might be of advantage to study this reflex in cases of paresis of slight degree.

ALLING.

In ROGMAN'S (45, Curability of siderosis of the eye) case a piece of iron had entered the eye nine years before and had produced siderosis bulbi with grayish-brown discoloration of the iris and a cataract. After iridectomy and extraction of the cataract, the vision, with correcting lens, was $\frac{1}{2}$. Examination of the cataract by Perl's method demonstrated the siderosis. Rogman refers to the cases of Leber, von Hippel, and Cramer, in which good final results were obtained in siderosis of the iris and lens, while in Hirschberg's the vision gradually sank from $\frac{5}{60}$ to fingers at five feet. In Hirschberg's case the refractive media of the eye were cloudy after the extraction of the cataract. The prognosis of siderosis of the anterior segment of the eye seems to be good, in conformity with the experiments of Leber, while that of siderosis of the posterior segment seems to be unfavorable.

BERGER.

SPRATT [46, The use of paraffin spheres in Frost's operation (modified Mules's) with a report of 23 cases] has introduced balls of paraffin into Tenon's capsule after enucleation in 13 cases, and is much pleased with his results. The freely movable artificial eye gives no impression of being sunken. Secretions cannot collect behind it. Paraffin is excellent for the purpose,

because it is unirritating, adapts itself easily to the form of the cavity, and is soon fixed by an enveloping connective-tissue capsule.

ABELSDORFF.

MEYER (47, Enucleation of the eyeball under combined local anæsthesia) undertook to perform enucleation under combined surface and infiltration anæsthesia. For the incision in the conjunctiva and the division of the insertions of the muscles, he instilled cocaine into the conjunctival sac ; for the section of the optic and ciliary nerves, he used Schleich's infiltration anæsthesia. He introduced the slightly curved canula of an Anel's syringe to the posterior polar region and injected half a syringe-ful of Schleich's fluid, cocaine *mur.* 0.1, morphine 0.025, *natr. chlor.* 0.2, *aquæ dist.* 100.0. Two minutes later he divided the nerves.

In order to demonstrate the resorbent action of dionin, MCKEE (48, Experimental researches regarding the resorbent peculiarity of dionin) injected an emulsion of India ink into the anterior chambers of a dog, a cat, and a rabbit. He then instilled in each eye, daily, two drops of a 10% solution of dionin. Chemosis resulted in the dog and the cat, but not in the rabbit. In the latter the dionin failed to produce resorption, while in the dog and the cat the resorption of the India ink was evident. It also exhibited a markedly resorptive effect on the corneal opacities. Probably the action which produces the chemosis is a prerequisite for the resorptive action of the dionin.

COHN (49, Mishaps of intraocular disinfection with iodoform) introduced rods of iodoform into four infected eyes with no practical result. One eye went on to phthisis bulbi, the other three had to be enucleated.

The patient described by OGG (51, A case of acute plumbic encephalopathy followed by muscular paralysis and optic neuritis) was a woman aged twenty-three who had worked for nine years in a lead factory, and during that time she had suffered from anæmia, amenorrhœa, and attacks of colic and constipation. Suddenly she was seized with umbilical pain, headache, vomiting, and vertigo, followed by delirium and loss of consciousness. When this latter returned, after six days, both forearms and one leg were paralyzed. Optic neuritis which led to atrophy caused blindness.

MARSHALL.

BUCHANAN (52, Mycoses with special reference to mycosis of the eyeball) states that it is admitted that only a few of the

moulds affect the human body, and these include *aspergillus fumigatus*, *a. nigricans*, *a. flavescens*, *a. glaucus*, and *penicillium glaucum*. The first of these is the most frequently present in the eye. Buchanan has found 21 recorded cases: 14 were reported from Germany, 2 from Scotland, 2 from the United States, and one each from Russia, France, and Italy. The cornea is the most commonly affected, though the fungus has been found growing in the interior of the eye. The appearance of the disease is usually that of a hypopyon ulcer; the floor of the ulcer has a sharply defined edge, and is raised above the level of the surrounding cornea. This is gray and may remain for weeks or months. The hypopyon is almost a constant feature. There is considerable pain, but there is no tendency for either local or general extension. The most effectual treatment is to destroy the affected area. Cultures can be made on any medium at 37.5°, and preparations stain well with Ehrlich's hæmatoxylin.

MARSHALL.

III.—INSTRUMENTS AND REMEDIES.

53. RAMSAY, A. MAITLAND. An adjustable stereoscope for training the fusion sense. *Ophthalmoscope*, Jan., 1905.
54. HAAB, Professor O. On the correct use of the giant magnet. *Ophthalmoscope*, Feb., 1905.
55. HIRD, BEATSON. Ethyl chloride in eye surgery, with an account of a fatality. *Ophthalmoscope*, March, 1905.
56. ELSCHNIG. Hæmolytic injections in recurrent vitreous hemorrhages. *Arch. f. Augenheilk.*, li., 4, p. 354.
57. SEEFELDER. Jequiritol. *Klin. f. Augenheilk.*, xliii., i., 3, p. 273.
58. V. ARLT, F. R. Argentum citricum, itrol Credé, in diseases of the eye. *Aerztl. Centralztg.*, 1905, No. 3.
59. MAGNONI, A. A new glass tube for sterilizable alkaloid tablets. *Klin. Monatsbl. f. Augenheilk.*, xliii., 1, p. 219.
60. HERTEL, E. A simple exophthalmometer. *Arch. f. Ophth.*, lx., 1, p. 171.
61. ROTH, A. The astigmoscope, a completion of Placido's keratoscope. *Ctrbl. f. pract. Augenheilk.*, xxix., p. 13.
62. HAY, PERCIVAL J. Studies in the light sense. *Arch. f. Ophth.*, xxiv., 2, p. 160.
63. POLACK, A. Périmètre-photoptomètre. *Annal. d'ocul.*, cxxxiii., p. 45.
64. OSTWALT, F. Hot, dry air baths in ophthalmology. *Annal. d'ocul.*, cxxxiii., p. 197.
65. SASSEN, M. A simple electric ophthalmoscope. *Ned. Tydschr. v. Geneesk.*, 1, No. 3.

66. MEISLING, A. A. An apparatus for mingling colors and the examination of the color-blind. *Hospitaltid.*, 1905, No. 229.

The instrument described by RAMSAY (53, An adjustable stereoscope for training the fusion sense) is a modification of Worth's amblyoscope. The instrument is made to stand securely on the table, and the substitution of total reflecting prisms for mirrors prevents the confusion arising from double images. Behind each picture is a small electric lamp, which is more convenient than lamps on sliding arms. The instrument is made by Trotter, 40 Gordon Street, Glasgow. MARSHALL.

In this paper HAAB (54, On the correct use of the giant magnet) gives his views of the correct way in which to proceed in the extraction of pieces of metal from the eyeball. He describes in detail the correct construction of a magnet suitable for the purpose, and lays great stress on the necessity of the switch worked by the foot, in order to enable the operator to instantly turn on or cut off the current as may be required. He much prefers to have the magnet fixed, for it is obviously much easier to move the head and eye of the patient than it is to move a magnet weighing 200 pounds. The greatest care should be exercised to prevent the foreign body being drawn into the ciliary body. An enlarged pupil is most useful in aiding the drawing of a particle into the anterior chamber. By very carefully placing the head of the patient in a suitable position, it is often possible to get the foreign body free in the anterior chamber. When this is done it can frequently be extracted by the small magnet, or, as Haab prefers, by the large one, after an incision has been made. Iridectomy should be performed as rarely as possible, and the author has never found it necessary. If the eye be inflamed, a small rod of iodoform should be inserted in the anterior chamber. In order to avoid injury to the vitreous he prefers to withdraw the foreign body through the anterior chamber, instead of making a fresh wound in the sclera and thus doing damage. If the foreign body has not been withdrawn from the eye by the proper use of the giant magnet, it is almost useless to attempt its extraction with the small magnet, especially if its position is uncertain.

MARSHALL.

HIRD (55, Ethyl chloride in eye surgery, with an account of a fatality) has had considerable experience in the administration of this anæsthetic, and considers it safe and convenient, and, with the exception of this one case he records, he has never seen any

trouble arise from its administration. The fatal case he describes was not an eye case. It was given for the purpose of opening a suppurating mass of malignant glands in the neck of a man who was as bad a case for an anæsthetic as could be imagined. He took the anæsthetic without struggling, and after $1\frac{1}{2}$ minutes he was considered ready for the operation. An incision was made over the swelling, and at once the patient stopped breathing. All means were adopted to restore him, but without result, and as the result of the evidence given at the inquest, death was considered to be due to the anæsthetic.

Römer demonstrated that blood can be caused to disappear from the vitreous of a rabbit's eye by the injection into the vitreous of a few drops of hæmolytic immune serum from guinea-pigs. ELSCHNIG (56, Hæmolytic injections in recurrent vitreous hemorrhages) accordingly injected hæmolytic immune serum from rabbits into the vitreous of the blind left eye of a man thirty-four years old in which there was a large hemorrhage. A severe plastic iritis followed and necessitated enucleation.

SEEFELDER (57, Jequiritol) has used jequiritol on twenty cases. Its use should be confined to hospital cases where possible, though exceptionally it may be used on an out-patient. He has no scruples against its simultaneous use in both eyes. The dose can be gauged. There are individual variations in the reaction. It is not absolutely without danger, as even when used carefully it may cause dacryocystitis and ulcerative keratitis. Therefore it is contraindicated in lachrymal disease and ulcerative conditions of the cornea, the more so because serum cannot repair any damage so caused. The question of the clinical application of the serum is therefore not yet finally decided. The treatment is dependent on the number of ophthalmias and of the complications. The average duration of an ophthalmia which runs a smooth course may be reckoned as eight days. The immunity will seldom shorten this time, because it is only exceptionally that it appears within the first three weeks. An intense ophthalmia promises a better result than a slighter reaction, yet good results may be obtained even with the latter. Jequiritol has an influence upon trachoma follicles; its peculiarity as a means of clearing the cornea is unquestioned, and herein lies its usefulness. Yet it is to be used only when other things have failed and special reasons urge a further attempt to clear the cornea. It does not cut short the course of an interstitial keratitis. It is absolutely indicated only

in old trachomatous pannus ; in recent pannus the usual treatment should precede.

VON ARLT (58, *Argentum citricum*, itrol Credé, in diseases of the eye) recommends *argentum citricum* or itrol Credé in conjunctivitis blenorrhoica, follicularis, catarrhalis, trachomatosa, diphtheritica, and lymphatica, and in corneal ulcers. He uses the powder and dusts it in the eye one or more times a day.

The exophthalmometer of HERTEL (60, *A simple exophthalmometer*) is composed of two mirrors which reflect the apex of the cornea. These mirror pictures fall upon two measures. The instrument is made by Zeiss.

ROTH'S (61, *The astigmatoscope*, a completion of Placido's keratoscope) astigmatoscope is a Placido's disk made of a thin plate of steel which can be rotated about the tube as an axis. On its posterior surface a white line shows the axis of the cylinder. When corneal astigmatism is present so that the disk looks like an ellipse, it is bent until the ellipse has become a circle.

HAY (62, *Studies in the light sense*) has constructed an instrument for the determination of the light minimum and the light difference by means of polarized light. He found the light difference enhanced by high degrees of refractive error and by optic atrophy. Vitreous opacities and choroiditis increase both. The forms of retinitis which affect the outer layers more than the inner are also in a higher degree prejudicial to the light sense.

ABELSDORFF.

The apparatus described by POLACK (63, *Périmètre-photoptomètre*) is used in the investigation of the visual field for light sense and color sense. A philoptometer is moved from the periphery toward the centre and the intensity of the light can be quantitatively varied by a diaphragm. The investigation is begun first in a dark room in which a phosphorescent body serves for the fixation of the visual line, the light minimum for white or any color is determined, and then the determination is made in daylight.

BERGER.

OSTWALT (64, *Hot, dry air baths in ophthalmology*) describes an apparatus for the use of hot, dry air baths in the treatment of eye diseases. The eye can stand a higher temperature than the lids, even as high as 150° to 175° C. The duration of the use of the apparatus is thirty minutes, exceptionally twice a day. It is

indicated in trigeminal neuralgia, chronic inflammation of the lids, pannus, parenchymatous keratitis, iritis, and iridochoroiditis.

BERGER.

SASSEN (65, A simple electric ophthalmoscope) has constructed an electric ophthalmoscope. He uses for the source of light a lamp of 4 volts placed directly beneath an oblique plane mirror. In order to prevent reflexes the mirror is not perforated, an aperture being made simply in the foil. With this instrument the fundus can easily be examined even without a dark room.

JITTA.

MEISLING (66, An apparatus for mingling colors and the examination of the color-blind) has constructed a simple apparatus for the mingling of colors in which the rays from two sources of light mingle upon a screen. By moving the screen, the part taken by the rays from either source of light can be regulated and thus many shades of color produced. The apparatus can be used for the demonstration of color-blindness by means of lanterns and for investigation with complementary and non-complementary colors.

HELGREN.

Sections IV.-VII. Reviewed by DR. ABELSDORFF, Berlin.

IV.—ANATOMY.

67. WERNCKE, THEODOR. A contribution to the anatomy of the lachrymal sac with special reference to the question of the lachrymal glands. *Kl. Monatsbl. f. Augenheilk.*, xliii., 1, p. 191.

68. JACOBY, E. The neuroglia of the optic nerve. *Kl. Monatsbl. f. Augenheilk.*, xliii., 1, p. 129.

69. MÜNCH, K. Anatomy of the dilatator pupillæ. *Zeitschr. f. Augenh.*, xliii., 1, p. 1.

70. MATYS. A malformation of the eye due to an amniotic band in a human embryo of the fourth month. *Zeitsch. f. Augenh.*, xliii., 2, p. 150.

71. ENSLIN. The histology of the caruncula lachrymalis in man. *Arch. f. Augenheilk.*, li., 3, p. 253.

72. COATS, GEORGE. The structure of the membrane of Bruch and its relation to the formation of colloid excrescences. *Royal London Hospital Reports*, xvi., 2, p. 164.

73. ANTONELLI. Exceptional arrangement of myelin fibres. *Soc. d'ophthalmologie de Paris*, Feb. 7, 1905.

74. ROCHON-DUVIGNEAUD. The human macula. *Soc. d'ophth. de Paris*, Feb. 7, 1905.

75. KONDRATIEW. The lachrymal organs of rabbits. *Westn. Ophthal.*, 1905, 1.

WERNCKE (67, A contribution to the anatomy of the lachrymal sac, with special reference to the question of the lachrymal glands) found in normal lachrymal sacs groups of tubular glands with sharply defined margins, evidently a distinct organ. In diseased sacs, in which pseudo-glands are frequently found, none were demonstrable. In addition to these larger glands there were present small groups of, and single, tubular glands which were not of pathological origin.

JACOBY'S (68, The neuroglia of the optic nerve) researches were made with the help of Weigert's glia stain and showed the rich endowment of the papilla with glia tissue.

MÜNCH (69, Anatomy of the dilatator pupillæ) claims for the network of stroma cells in the iris the character of the dilatator pupillæ. The fibres of this network are nearly all radiating, and purely circular fibres are very rare. In the posterior layers of the iris, the processes of the iris cells are directly joined to the anterior layer of pigment epithelium, the so-called musculus dilatator. Without combating the participation of the latter in the dilatation of the pupil, Münch ascribes to the network of the stroma cells, which he conceives to be an active muscular network, the rôle of the true dilatator.

ENSLIN (71, The histology of the caruncula lachrymalis in man) has examined numerous caruncles anatomically. In the caruncle are to be distinguished the epithelium, the tunica propria, and the submucous tissue, the hairs, the sebaceous glands, and the accessory lachrymal glands. In the layers of pavement epithelium goblet cells are present both as solitary cells and grouped into primitive mucous glands which take the form of an alveolus containing a tube.

COATS (72, The structure of the membrane of Bruch and its relation to the formation of colloid excrescences) shows that by means of Weigert's stain for elastic fibres the division of the membrane of Bruch into two parts is clearly brought out, the outer a layer of very fine elastic fibres, the inner a homogeneous layer. The colloid bodies (Drusen) spring from the homogeneous layer which is a cuticular product of the pigment epithelium, while the elastic layer is of mesoblastic origin. The elastic layer passes the excrescences unchanged, which are, like the homogeneous layer, a product of the pigment epithelial cells. Although the entire membrane appears unchanged with the usual eosin stain, Weigert's stain shows that the colloid bodies, which do not take the

stain, are exclusively excrescences from the inner homogeneous layer.

ROCHON-DUVIGNEAUD (74, The human macula) had the opportunity to examine the macula lutea in a state of good preservation in two cases. He states that the fovea does not form as deep a depression as was formerly taught. In the most central part of the fovea he found uncommonly fine rods.

V.—PHYSIOLOGY.

76. WLOTZKA, E. The synergy of accommodation and pupillary reaction. *Pflüger's Arch.*, 107, 3 and 4, p. 175.

77. HESS, C. The process of stimulation in the eye. *Ibid.*, 107, p. 290.

78. FEILCHENFELD, H., and LOESER, L. The influence exerted upon one light sensation by another simultaneous light sensation. *Arch. f. Ophthalm.*, lx., 1, p. 97.

79. GUILLERY. Further researches on the physiology of the sense of form. *Arch. f. Augenheilk.*, li., 3, p. 209.

80. ABELSDORFF, C., and PIPER, H. Comparative measurements of the size of the directly and consensually reacting pupil. *Ibid.*, li., 4, p. 366.

81. HESS, C. Lenticular images formed by reflection from the nucleus of the normal lens. *Ibid.*, li., 3, p. 375.

82. VON BECHTEREW. The cortical field of vision and its relations to the ocular muscles. *Arch. f. Anat. u. Physiol.*, Physiol. Abtheil., 1 and 2, p. 53, 1905.

83. GRYNS, G., and NOYONS, A. K. The absolute sensitiveness of the eye to light. *Ibid.*, p. 25.

84. KLEIN, FR. A contribution to the physiology of the organs of sense, particularly the eye. *Ibid.*, p. 25.

85. BACH, L. Pupillary reflex centres and tracts. *Zeitschr. f. Augenheilk.*, xliii., 3, p. 260.

86. BACH, L., and MEYER, H. The relation of the trigeminus to the pupil and to the ciliary ganglion. *Ibid.*, xliii., 3.

87. HEINE. Stereoscopic vision in the mirror stereoscope. *Monatsbl. f. Augenheilk.*, xliii., 1, p. 40. (A compilation of the principles which govern the production of plastic pictures in the use of the stereoscope.)

88. DEPÈNE, R. The dependence of depth perception on the inclination of the head. *Ibid.*, xliii., 1, p. 48.

89. BUSCK, GUNNI. Colored light filter. *Zeitschr. f. Psychol. u. Physiol. d. Sinnesorg.*, xxxvii., 1 and 2, p. 154.

90. REIMANN, E. The apparent increase in the size of the sun and moon at the horizon. An addition to an article under the same title in vol. xxx. of this *Zeitschrift*. *Ibid.*, xxxvii., 3 and 4, p. 250. (The addition contains an account of the problem together with the most recent observations and theories.)

91. ANGIER, ROSSWELL P. **Comparative measurement of the compensatory rolling of the two eyes.** *Ibid.*, xxxvii., 3 and 4, p. 235.
92. ANGIER, ROSSWELL P. **Comparative determination of the peripheral value of trichromatic and deuteranopic eyes.** *Ibid.*, xxxvii., 6, p. 401.
93. WILLIAMS, C. H. **The cortical fusion of some color sensations.** *Trans. Amer. Ophthal. Soc.*, 1904.
94. COLLINS, TREACHER. **On the development of the accommodative power of the human lens.** *Royal London Ophth. Hospital Reports*, xvi., 2, p. 123.
95. BERTIN-SANS and GAGNIÈRE. **On the mechanism of accommodation.** *Comptes rendus de l'acad. des sciences*, cxl., p. 387.
96. CONSTANTIN. **The re-formation of the retinal image in vertebrates.** *Recueil d'opht.*, xxvii., p. 135.
97. CANTONNET. **Contributions to the study of the osmotic changes between the intraocular humors and the blood plasma.** *Thesis*, Paris, 1905.
98. DANILEWSKY. **Subjective visual sensations in the alternating magnet field.** *Wratsch*, No. 13, 1904.

WLOTZKA (76, The synergy of accommodation and pupillary reaction) has investigated whether the contraction of the pupil is associated with the convergence or accommodation. The visual lines converged on a disk several metres away. Between this and the eyes were placed two half images so that the visual lines passed through their centres, which were united into one point by binocular fusion. By looking in turn at the distant disk and the near point the accommodation was made to vary 10 dioptries while the convergence remained the same, and the pupil was found not to change. Hence accommodation and the reaction of the pupil are independent of each other.

FEILCHENFELD's and LOESER's (78, The influence exerted upon one light sensation by another simultaneous light sensation) article deals with (1) the influence exerted upon the light sensation in one eye by a simultaneous light sensation in the other, affecting (a) corresponding parts of the retina, (b) other parts; (11) the influence exerted upon the light sensation in one eye by a simultaneous stimulation of another part of the retina of the same eye.

In 1 a adaptation to light and dark must be taken into account. In adaptation to light, the light stimulations affecting corresponding places in the two retinae reciprocally inhibit each other, and also equally if the stimulations are of equal strength. When they are unequal, the stronger inhibits the weaker. In adaptation to the dark, the contrary effect obtains.

(1 *b*). The action of the stimulation of dissimilar parts of the retina is the same in adaptation to both light and dark. It is the more inhibitive the greater its strength and the nearer it approaches the corresponding place.

The inhibition in 1 *a* is physiological, in 1 *b* psychological.

In 11 the disturbance of vision on stimulation of different places in the same eye is greater than on stimulation of dissimilar places in the two eyes, does not disappear on prolonged observation as in the latter case, and is to be ascribed for the most part to physical causes.

GUILLERY (79, Further researches on the physiology of the sense of form) shows that the sense of form is doubtless dependent on the size of the retinal image, but cannot be measured simply by the visual angle, because, for example, the perception of the interspace between two vertical lines is also dependent on the length of the latter. If, therefore, vision is defined as the ability to recognize separated points and lines, Snellen's system is insufficient for the measurement of the vision.

ABELSDORFF and PIPER (80, Comparative measurements of the size of the directly and consensually reacting pupil) have decided the question whether the illuminated pupil contracts more than the one reacting consensually, by photographing with a flash light the pupils of both eyes, one shaded and the other exposed to light. The diameter of the pupils could be measured on the developed and enlarged negatives to within 0.05 mm. It was proved conclusively that pupils of equal size became unequal when one alone is illuminated and that the illuminated pupil becomes the smaller. This result shows that it is necessary to always exclude an unequal illumination in making a diagnosis of a pathological difference between the pupils. It also shows that the almost universally accepted design of the pupillary reflex tract can no longer rest on the equality of the direct and consensual light reaction as one of the evidences of its correctness.

HESS (81, Lenticular images formed by reflection from the nucleus of the normal lens) finds that accurate investigation reveals four lenticular images in the human eye after the middle of the twentieth year, two from the anterior and posterior surfaces of the lens itself, and two from the anterior and posterior surfaces of the nucleus. The transition from the refractive index of the cortex to that of the nucleus is not as gradual as has been thought, but more sudden, as shown by the production of these

images, and the course of the rays in the eye is more complex than in the theories heretofore accepted. There are five, instead of three, separate surfaces to be taken into account.

GRYNS and NOVONS (83, The absolute sensitiveness of the eye to light) have determined that there is no absolute magnitude of the energy necessary to the production of a light sensation, but that the duration of its action is of greater importance. The amount of stimulating energy necessary to the production of a light sensation decreases with the duration of the illumination.

KLEIN (84, A contribution to the physiology of the organs of sense, particularly the eye) demonstrates that the organ of vision can be stimulated only by changes in its external conditions, founded on the fundamental property of protoplasm: the retina cannot illuminate itself. The author seeks to explain different optic phenomena which give the impression of a self-illumination of the retina, *e. g.*, the well-known production of pressure phosphenes. According to his hypothesis the illumination from the external light of places on the retina is reflexly made intermittent. This interrupted illumination induces a constant tetanic sensation which prevents the onset of "rest blindness" (*Rubeblindheit*).

BACH and MEYER (86, The relation of the trigeminus to the pupil and to the ciliary ganglion) paralyzed the sympathetic cells of the ciliary ganglion and the superior cervical ganglion of rabbits by the intravenous injection of nicotine and by irritation of the lateral portion of the medulla oblongata and the trigeminus obtained contraction of the pupil on the same side. The fibres of the trigeminus which are able to produce contraction of the pupil cannot therefore pass through the ciliary ganglion; it is more likely that in rabbits they pass directly to the sphincter.

DEPÈNE (88, The dependence of depth perception on the inclination of the head) has shown by means of tests with Hering's three-rod apparatus that the power of depth perception is finest when the longitudinal axis of the object and the sagittal axis of the head are parallel. A variation of 40° of these axes from each other caused a marked interference with the perception of depth; one of 70° or 80° rendered such perception impossible. When points instead of rods were used, the recognizable stereoscopic difference always remained the same.

BUSCK (89, Colored light filter) furnishes tables which enable

investigators to find immediately the proportion of absorption when they are using Nagel's light filter for the re-establishment of light closely approaching monochromatic.

ANGIER'S (91, Comparative measurement of the compensatory rolling of the two eyes) observation deals with the peculiarity observed by Delage, that when the body is turned to one side the rotation of one eye is different from that of the other. Angier's statement, that the accuracy of the perception of depth is the same whether the head is inclined toward the shoulder or not, agrees with this observation only under the assumption that any single eye examined by itself exhibits a peculiar rotation. But measurements made with the aid of after-images demonstrate that the compensatory rotations of the two eyes are identical, so that the difference between the compensatory rotations of the two eyes claimed by Delage cannot be confirmed.

ANGIER'S (92, Comparative determination of the peripheric value of trichromatic and deuteranopic eyes) researches supplement the fact discovered by von Kries, that colored lights are seen in the extreme periphery of the retina, where they appear to be colorless, with a different degree of clearness by trichromates and protanopes. The author has determined the clearness of the peripheral value of spectral lights by a comparison of Prof. Nagel's deuteranopic eye with several trichromatic eyes. The pupils were dilated artificially to secure good adaptation to light. The maximum of the peripheric value of the deuteranope was found to be moved toward the red end of the spectrum, while v. Kries found a movement toward the green end for protanopes. Just as the clearness of colored lights in direct vision is different for protanopes than for trichromates, so Nagel found green much clearer in central vision than did the trichromates.

BERTIN-SANS and GAGNIÈRE (95, On the mechanism of accommodation) determined the radius of curvature of the anterior surface of the lens of the rabbit's eye under the influence of eserine and of atropine. The animals were then killed and the radius of curvature of the anterior surface of the lens again determined. The latter almost coincided with that of the atropinized eye. On account of this last fact, they question the correctness of Tscherning's theory of accommodation, which assumes that the change in the radius of curvature of the surface of the lens, which takes place during accommodation, is caused by the tension of the zonula.

BERGER.

According to DANILEWSKY (98, Subjective visual sensations in the alternating magnet field), if an eye is approached to the radiator in the greatly alternating magnet field, a flickering, in the form of concentric waves of light, appears in the periphery of the field of vision. A series of experiments shows that these subjective light sensations are caused by induced action in the alternating magnet field. The induced stimulation calls forth, in his opinion, a clonic spasm of the ciliary muscle, and thereby an intermittent mechanical stimulation of the peripheral zone of the retina.

HIRSCHMANN.

VI.—REFRACTION.

99. LANGE, O. The nature of progressive myopia. *Arch. f. Ophth.*, lx., 1, p. 118.

100. AMMON. Spasm of the accommodation. *Deutsch. militärärztl. Zeitschr.*, xxxiv., 1, p. 46.

101. HERBST. Spasm of the accommodation and abnormal tension of the accommodation. *Klin. Monatsbl. f. Augenheilk.*, xliii., 1, p. 77.

102. LAGRANGE, FELIX. Treatment of myopia by the extraction of the transparent crystalline lens. Remote results. *Annal. d'oculist.*, cxxxii., p. 421.

103. LONTEW, W. A. A rare case of pathological astigmatism. *Westn. Ophthalm.*, 1905, 2.

104. ZEEMANN, W. P. C. The relation between the refraction and the refractive system of the eye. *Inaug. Dissert.*, Amsterdam, 1905.

105. SCHOUTE, G. J. A peculiarity of eyes with mixed astigmatism. *Ned. Tydschr. v. Geneesk.*, 1905, 1, No. 3.

106. V. D. BORG. Statistical and other contributions to the knowledge of astigmatism. *Inaug. Dissert.*, Amsterdam, 1905.

LANGE (99, The nature of progressive myopia) found in four myopic eyes the entire sclera markedly poor in elastic fibres, while in five emmetropic eyes the elastic fibres were numerous. The same difference was present in the two eyes of one individual who had one myopic and one emmetropic eye. As the choroid of the myopic eyes possessed a weak elastic network, and as the sclera of a hydrophthalmic eye was rich in elastic fibres, Lange considers the poverty of the sclera as regards elastic fibres in the myopic eyes examined to be not secondary to tension, but a primary congenital condition which determines the nature of progressive myopia.

AMMON (100, Spasm of the accommodation) has frequently observed a clonic form of spasm of the accommodation at the beginning of target practice, especially among people who only

occasionally wear their correcting lenses. This usually requires no treatment. He has also seen a tonic spasm, most often in connection with neurasthenia and hysteria. The diagnosis is certain when, after the effect of the atropine has passed off and the pupil has returned to its normal size, the refraction remains less than before the use of atropine. Perfect vision is also not to be obtained with glasses. In tonic spasm of the accommodation, an energetic treatment with atropine is indicated. In many cases it is difficult to remove the spasm even with the aid of atropine.

HERBST (101, Spasm of the accommodation and abnormal tension of the accommodation) distinguishes between a spasm of the accommodation and a tension of the accommodation in which the over-contraction of the ciliary muscle is evident on testing the vision, but is absent ophthalmoscopically. He found eight cases of accommodative tension of 1 D. or more among eighty persons without astigmatism, and one case of spasm. The treatment in all cases was atropine for two weeks.

LONTEW (103, A rare case of pathological astigmatism) describes a transparent flattening of the cornea in the region of which the hypermetropia was 4 D., the hypermetropic astigmatism 2 D. The flattened surface was surrounded by a myopic zone.

HIRSCHMANN.

ZEEMANN'S (104, The relation between the refraction and the refractive system of the eye) conclusions are: Eyes with very short axes are usually hypermetropic, those with very long axes are usually myopic, yet there are emmetropic eyes with pretty long or short axes. Such emmetropic eyes are either very large or very small in all of their measurements, or they exhibit a special relationship between the radii of the cornea and of the anterior surface of the lens which maintains the emmetropia. The dioptric apparatus of persons of different refraction shows peculiarities which indicate an inclination toward partial correction of the error. The loss occasioned by the shortening or lengthening of the eyeball is diminished by a compensatory change in the refractive system. The measurements of the various components of this system indicate that this correction is made by the lens. In high degrees of hypermetropia there is a correcting increase in the curvature of the lens. Thus a connection is formed between the degree of the error and the correction through the lens or the tone of the ciliary muscle. JITTA.

According to SCHOUTE (105, A peculiarity of eyes with mixed astigmatism), a light point usually produces a circle of diffusion on the retina of an emmetropic eye. If a stenopaic slit is placed before the eye, a line of diffusion is formed on the retina parallel with the slit. An eye with mixed astigmatism forms an exception to this rule. In such an eye there must be an emmetropic meridian between the principal hypermetropic and the principal myopic meridians. If a stenopaic slit is placed in this meridian, the eye accurately perceives alternating black and white lines only when they are perpendicular to the direction of the slit. This fact is contrary to the observations on other eyes, and in order to explain it it is necessary to follow the course of the rays of light in an eye with mixed astigmatism. Schoute concludes that in such eyes the so-called emmetropic meridian does not deserve that name. A diffusion line is formed and the diffuse light falls on the figures themselves only when the lines under observation are perpendicular to the direction of the slit, and in these cases only are they distinctly visible. JITTA.

VAN DER BORG (106, Statistical and other contributions to the knowledge of astigmatism) has compiled the statistics of the persons with astigmatism who have sought relief at the *Universtitätspoliklinik* in Amsterdam between 1895 and 1904. The number of such persons was 2932, 7.2 % of all patients, with 5324 eyes. The refraction was determined both subjectively and skiascopically. They were thus divided.

Simple hypermetropic astigmatism	1709 eyes, 32 %
Compound " "	1388 " 26 %
Simple myopic " "	1377 " 25 %
Compound myopic " "	570 " 11 %
Mixed astigmatism	319 " 6 %

In the cases of hypermetropic astigmatism, an astigmatism of 2 D. was the most frequent. As regards the axis, the axis of the greatest curvature was vertical in 1081, horizontal in 349, and oblique in 164. The vision with astigmatism of 1 D. was rarely normal and rapidly failed with an increase of the refractive error. The vision is best when the meridian of the greatest curvature is horizontal; under this condition myopes see better than hypermetropes. Persons with astigmatism are in less danger of strabismus than either myopes or hypermetropes. Strabismus is more frequent with hypermetropic than with myopic astigmatism, and those persons in whom the maximum of refraction is hori-

zontal have the least tendency to squint. Van der Borg's observations also show that astigmatic persons prefer the appearance of a focal line to that of a focal circle.

JITTA.

VII.—MUSCLES AND NERVES.

107. PICHLER, K. Rheumatism of the ocular muscles. *Wien. klin. Wochenschr.*, 1905, No. 14.
108. FEILCHENFELD, H. A case of sensory ataxia of the ocular muscles. *Zeitschr. f. klin. Medicin*, 56, 3 and 4.
109. ELSCHNIG. Advancement of the levator. Remarks on Hugo Wolff's operation for ptosis. *Wien. med. Wochenschr.*, Nos. 30 and 45, 1904.
110. ARONHEIM. A case of traumatic paralysis of the right abducens. *Monatsschr. f. Unfallheilk.*, xii., No. 1, p. 13.
111. HÄHNLE. Intermittent convergent strabismus. *Ophthalm. Klinik.*, Feb.
112. WORTH, CLAUDE. Strabismus: etiology, pathology, and therapy. Authorized German edition by Dr. E. H. Oppenheimer; Berlin, Julius Springer, 1905.
113. DUANE, A. Congenital deficiency of abduction associated with impairment of adduction, retraction movements, contraction of the palpebral fissure, and oblique movements of the eye. *ARCH. OF OPHTH.*, xxxiv., 2, p. 133. (A compilation of his own cases with those already published.)
114. HUBBELL, A. A. Blindness and oculomotor palsies from injuries not involving the optic or oculomotor nerves. *Four. Amer. Med. Assoc.*, Jan. 7, 1905.
115. OLIVER, C. A., and HOYT, D. M. The direct action of drugs upon the extrinsic muscles of the eyeball. Preliminary notes upon a few of the findings obtained. *Annals of Ophthalm.*, Jan., 1905.
116. DUANE, A. Prism exercises, their indications and technique. *Trans. Amer. Oph. Soc.*, 1904.
117. LAMBERT, W. E. A case of ophthalmoplegia externa bilateral. *Trans. Amer. Oph. Soc.*, 1904.
118. LANNOIS, M., and FERRAND, C. Motor ocular paralysis of otitic origin. *Rev. hebdomadaire de laryng., d'otol. et de rhinol.*, July 2, 1904.
119. ROCHE, CHARLES. Notes on two traumatic ocular paralyses. *Recueil d'ophtalmologie*, xxvii., page 73.
120. LANDOLT, E. A new operation on the ocular muscles. Muscular lengthening. *Arch. d'ophtal.*, xxv., p. 1.
121. LAZAREW, E. G. Diagnosis of paralysis of the ocular muscles by means of double images. *Westn. Ophth.*, 1905, 2.
122. BLAGOWESCHTSCHENSKY. Tenotomy with stretching. (Panas's operation.) *Westn. Ophth.*, 1905, 2.

PICHLER (107, Rheumatism of the ocular muscles) observed four cases of rheumatism of the ocular muscles among 160 cases of acute articular rheumatism. The tendons of one or more

muscles were sensitive to pressure, and there extended backward from the insertion a diffuse, reddish, flat swelling which disappeared in a few days under antirheumatic treatment and was to be differentiated from episcleritis.

FEILCHENFELD (108, A case of sensory ataxia of the ocular muscles) observed, in a man thirty-nine years old who had free motility of both eyes when the vision followed an object held before them, an inability to move the eyes either laterally or vertically without fixation of an object. Attempts to do so caused a spasm of convergence. As the centrifugal tract of the ocular movements was intact, the author placed the lesion in the sensory part of the centripetal tract (sensory ataxia). He assumes a deficiency in the kinæsthetic perception of the motor organ of the eye, which is apparent only when the movements of the eye are not guided by stimulation of the retina. At such times the eyes assume a position of convergence due to a pathological change from a previous, but healed, paresis of the externi.

ARONHEIM'S (110, A case of traumatic paralysis of the right abducens) patient was knocked down by a blow from a ladder on the right side of the head. A short time later paralysis of the right abducens and hemorrhage from the right Eustachian tube were found. The diagnosis made was of a fracture of the petrous portion of the temporal bone and laceration of the abducens before its entrance into the cavernous sinus.

HUBBELL (114, Blindness and oculomotor palsies from injuries not involving the optic or oculomotor nerves), thinking that he could exclude direct injury to nerve and muscle in cases of paralysis from traumatism, offers the suggestion that the condition may be due to reflex action.

ALLING.

OLIVER and HOYT (115, The direct action of drugs upon the extrinsic muscle of the eyeball. Preliminary notes upon a few of the findings obtained) offer some generalizations regarding the effect of certain drugs (not named) upon the eye muscles of animals. The experiments were made with muscles separated from the eye and immersed in solutions as well as by injections about the muscles and sheath. There is a definite response of the muscle to the influence of the drugs and to the different strengths of the same drug. Further particulars are promised.

ALLING.

LAMBERT (117, A case of ophthalmoplegia externa bilateral)

ascribes the paralysis to a subacute polio-encephalitis superior, due to the gripe. ALLING.

LANDOLT (120, A new operation on the ocular muscles. Muscular lengthening) recommends in the place of tenotomy a lengthening of a short muscle by an oblique incision of the latter, shifting the cut surfaces and securing the latter in their new relation by sutures previously introduced. BERGER.

Sections VIII.-XII. Reviewed by DR. R. SCHWEIGGER, Berlin.

VIII.—LIDS.

123. VALUDE. Incidents and accidents in Parinaud's operation for ptosis. *Soc. d'ophthalm. de Paris*, Dec. 6, 1904.

124. BRAUNSTEIN, E. P. The operative treatment of ptosis. *Westnik Ophthalmolog.*, 1905, 1.

125. SILFVAST, J. A case of large defect of the eyelid repaired by means of Thiersch grafts. *Finska läkaresällsk. Handl.*, 1905, p. 1.

126. VALUDE. Chromidrosis of the lid. *Soc. d'ophthalm. de Paris*, Feb. 7, 1905.

127. PANSE, G. A case of adenoma of the Meibomian glands. *Klin. Monatsbl. f. Augenheilk.*, xliii., 1, p. 88.

128. BLOK, D. G. Angiosarcoma of the upper lid. *Ned. Tydschr. v. Geneesk.*, 1, No. 3, 1905.

129. TROUSSEAU, A. An epithelioma of the lid. *Ann. d'oculistique*, cxxxiii., p. 36.

130. TAYLOR, JAMES. Case of congenital ptosis and meningocele. *Report of the Society for the Study of Diseases of Children*, vol. 4.

VALUDE (123, Incidents and accidents in Parinaud's operation for ptosis) reports a case in which as a consequence of Parinaud's operation for ptosis an opacity of the upper third of the cornea with reduction of the sensibility was produced. He thinks that during the operation a nerve branch passing from the conjunctiva to the cornea was injured. BERGER.

BRAUNSTEIN (124, The operative treatment of ptosis) obtained excellent results in three cases of paralytic ptosis by means of Lapersonne's operation modified by himself with regard to the insertion of the ligatures. HIRSCHMANN.

VALUDE'S (126, Chromidrosis of the lid) case was one of chromidrosis with carcinoma of the lower lid. The discoloration was also present in the palpebral conjunctiva. In the discussion, Rochon-Duvigneaud considered that it showed some analogy to xeroderma pigmentosum, which, however, does not occur on the face. BERGER.

A man seventy-five years old had a tumor nearly as large as an egg hanging from his upper lid. It was removed with its capsule and was determined by PANSE (127, A case of adenoma of the Meibomian glands) to be a benign adenoma of the Meibomian glands.

TROUSSEAU (129, An epithelioma of the lid) reports a case of epithelioma of the lid of a woman sixty-eight years old, which he had watched for eight years. It had been "cured" four times by the application of antiseptics, methyl blue, Czerny-Trunczek's method, potassium chloride, and the X-rays. Each time there was a recurrence until finally it was permanently cured by removal.

BERGER.

In the case reported by TAYLOR (130, Case of congenital ptosis and meningocele) the patient was a lad aged five and one-half years whose eyes had always been prominent. He had an oxycephalic skull, an occipital meningocele, proptosis, squint, nystagmus, and defective mental condition. His sight had recently become greatly affected by optic atrophy.

MARSHALL.

IX.—LACHRYMAL APPARATUS.

131. V. BRUN. Symmetrical swelling of the lachrymal and salivary glands in pseudo-leucæmia. *Beitrage z. klin. Chir.*, vol. 45, No. 2.

132. CHEINISSE, L. Mikulicz's disease. *Semaine méd.*, 1905, No. 2.

133. STEIREN, EDW. Cystadenoma of the lachrymal gland. *Trans. Amer. Ophth. Soc.*, 1904.

134. MORAX, V. Concretions of the canaliculi. *Annales d'oculistique*, cxxxiii., p. 188.

135. LAGRANGE, F. Actinomycosis of the lachrymal passage. *Gaz. hebdomadaire des sciences méd. de Bordeaux*, Nov. 6, 1904.

136. DUPUY-DUTEMPS. Papilloma of the lachrymal sac. *Soc. d'ophth. de Paris*, Jan. 6, 1905.

137. TERSON, A. Prelachrymal sebaceous cyst. *Soc. d'ophth. de Paris*, Jan. 6, 1905.

138. CHAPPÉ, T. Paralachrymal tuberculous neoplasms. *Annales d'oc.*, cxxxiii., p. 177.

VON BRUN (131, Symmetrical swelling of the lachrymal and salivary glands in pseudo-leucæmia) considers it probable that the cases of symmetrical swelling of the lachrymal and salivary glands have a common origin with the pseudo-leucæmia, perhaps an infectious agent which enters the glands by way of the blood.

CHEINISSE'S (132, Mikulicz's disease) article is a résumé of what is known about Mikulicz's disease, chronic swelling of the

lachrymal and submaxillary glands. He ascribes the trouble to an exogenous infection from the mucous membranes to the excretory ducts of the glands, and finally to the glands themselves.

BERGER.

X.—ORBIT AND NEIGHBORING CAVITIES.

139. WÜRDEMAN, H. W. **Exophthalmos and sphenoidal abscess.** *Ophth. Record*, Jan., 1905.

140. MORAX, V. **Osteo-periostitis of the orbit due to staphylococci.** *Soc. d'opht. de Paris*, Feb. 7, 1905.

141. DEBEVE. **Contribution to the study of foreign bodies in the orbit.** *Arch. d'ophtal.*, xxv., p. 157.

142. SNELLEN, H., Jr. **Specimens of tumors and abscesses of the orbit.** *Ned. Tijdschr. v. Geneesk.*, vol. 1, No. 3, 1905.

143. SPIEGLER, FR. **Bilateral exophthalmos from adenoid vegetations.** *Münch. med. Wochenschr.*, 1905, No. 20, p. 982.

144. UHTHOFF, W. **Exophthalmos of high degree from deformity of the skull.** *Klin. Monatsbl. f. Augenheilk.*, xliii., 1, p. 1.

145. BRAUNSCHWEIG. **Pulsating exophthalmos.** *Ibid.*, p. 356.

146. GALEZOWSKI, J. **Maxillary sinusitis with exophthalmos and optic neuritis.** *Soc. d'ophtalm. de Paris*, Feb. 7, 1905.

SNELLEN (142, Specimens of tumors and abscesses of the orbit) exhibited specimens of tumors and abscesses of the orbit which demonstrated the difficulty of making a differential diagnosis between them. An abscess does not always show signs of inflammation. On the other hand, he had met with a case of protrusion of the globe with signs of inflammation. Exenteration was performed because of the probability that a tumor was present. The patient died shortly afterward and the autopsy revealed a tumor of the frontal lobe. In another case he obtained pus by puncture, and yet a tumor was present. JITTA.

In UHTHOFF'S (144, Exophthalmos of high degree from deformity of the skull) case there was a high degree of oxycephaly with marked exophthalmos, neuritic atrophy of the optic nerve and total blindness, hydrocephalus externus with pachymeningitis and optic neuritis and finally hydrocephalus internus. He did not ascribe the optic neuritis to stenosis of the optic canal, but to inflammatory changes in the sheath of the optic nerve, and particularly to a supposed temporary intracranial pressure at the time of the early ossification of the sutures. The ossification of the sutures with the external hydrocephalus caused a marked contraction of the orbit.

BRAUNSCHWEIG (145, Pulsating exophthalmos) insists that auscultation should always be practised in exophthalmos because pulsation can be thus detected before it can be felt. An injury of the wall of the sinus can remain without complications and relatively harmless. An injury of the artery may possibly involve only its intima, and an aneurysm may gradually develop, the pulsation of which can be felt. Braunschweig describes very fully a pulsating exophthalmos after a shot in the temple, which he had studied by means of the X-rays and pulsation curves. Various therapeutic measures are mentioned, but sometimes none of them is satisfactory.

In GALEZOWSKI'S (146, Maxillary sinusitis with exophthalmos and optic neuritis) case a carious tooth resulted in a maxillary sinusitis with phlegmon of the orbit and optic neuritis. Vision was reduced to $\frac{1}{4}$. The antrum was opened according to Luc's method, and within two weeks the vision had returned to normal.

BERGER.

XI.—CONJUNCTIVA.

147. HARMAN. Lymph follicles in apparently healthy conjunctivæ. *Meeting of the Ophthalm. Section of the British Med. Assn.*, 1904.

148. ELLETT, E. C. Parinaud's conjunctivitis with report of three cases. *Ophthalmic Record*, Jan., 1905.

149. KATZ, R. A. Yellow ointment in acute infectious conjunctivitis. *Westn. Ophth.*, 1905, 2.

150. GUICHARD. Contribution to the study of the attenuated form of conjunctival diphtheria. *Thesis*, Paris, 1905.

151. DERBY, G. S. 1. The bacillus pneumoniæ found in a case of conjunctivitis. 2. The bacillus pyocyaneus found in a case of conjunctivitis. 3. Blank-cartridge wound of the eye. Panophthalmitis probably due to bacillus. *Amer. Jour. of Ophthal.*, Jan., 1905.

152. PFALZ. Treatment of blennorrhœa neonatorum. A couple of words in vindication of protargol. *Zeitschr. f. Augenh.*, xiii., 3, p. 212.

153. URATA, T. Experimental investigations of the value of Crede's drops. *Zeitschr. f. Augenheilk.*, xiii., 3, p. 242; 4, p. 335.

154. RAEHLMANN, E. Trachoma. Histological, ultramicroscopical, and physiologico-chemical studies. *Beiträge zur Augenheilk.*, 62, 1905.

155. PETERS, A. Further remarks on trachoma and on the treatment of chronic diseases of the conjunctiva. *Münch. med. Wochensch.*, 1905, 1.

156. POULARD. Contagion of trachoma. *Soc. d'ophthalm. de Paris*, Feb. 7, 1905.

157. ASTWAZATUROW, P. The importance of sanitary stations for the treatment of trachoma. *Wojenno med. Journ.*, Jan., 1905.

158. GREITZ, W. M. Ambulatory mechanical treatment of trachoma. *Wojenno med. Journ.*, March, 1905.

159. WASSJUTINSKY, A. G. X-ray treatment of trachoma. *Russk. Wratsch.*, 1905, No. 1.
160. MAKRAKOW, A. A. Essential contraction of the conjunctiva (pemphigus conjunctivæ). *Westn. Ophth.*, 1905, 1.
161. DE SCHWEINITZ, G. E., and SHUMWAY, E. A. Conjunctivitis nodosa with histological examination. *Trans. Amer. Ophth. Soc.*, 1904.
162. WÜRDEMAN, H. V. Ophthalmia nodosa. *Ophth. Record*, Feb., 1905.
163. RAY, J. M. Injuries to the eye from particles of a copying pencil getting into the conjunctival sac. Report of two cases. *Ophthal. Record*, Jan., 1905.
164. KAYSER, B. Injuries to the eyes from the larvæ of flies. *Kl. Monatsbl. f. Augenheilk.*, xliii., 1, pp. 205 and 394.
165. GRUNERT. Operation in total symblepharon of both lids to form a cavity for an artificial eye. *Ibid.*, p. 298.
166. GULLSTRAND, A. Building up of the fornix with supported flaps of epidermis. *Ibid.*, p. 312.
167. HOTZ, F. C. The use of Thiersch's skin flaps in the operation for total symblepharon. *Ibid.*, p. 319.
168. HERBERT, H. Two cases of colloid (hyaline) degeneration of tarsus and conjunctiva. *Royal London Ophth. Hospital Reports*, xvi., 2, p. 135.
169. COSMETTATOS, G. E. Papilloma of the bulbar conjunctiva with involvement of the cornea. *Annales d'oculistique*, cxxxi., p. 39.

KATZ (149, Yellow ointment in acute infectious conjunctivitis) recommends the use of the 1% yellow ointment in cases of acute infectious conjunctivitis with free discharge and extravasation of blood. He obtained improvement and healing, sometimes even in two or three days, both in fresh cases and in those in which nitrate of silver had been used for some time without avail.

HIRSCHMANN.

According to DERBY (151, 1. The bacillus pneumoniae found in a case of conjunctivitis. 2. The bacillus pyocyaneus found in a case of conjunctivitis. 3. Blank-cartridge wound of the eye. Panophthalmitis probably due to bacillus), the Friedländer bacillus pneumoniae has been found in ocular affections by a number of observers. Out of 150 cases of conjunctivitis he has discovered it in only one. The bacillus pyocyaneus is rarely found in the eye. The cause of the panophthalmitis in the third case was thought to be the common "hay bacillus" (bacillus subtilis).

ALLING.

PFALZ (152, Treatment of blennorrhœa neonatorum. A couple of words in vindication of protargol) has shown by a year's use

that a 1 to 5 % solution of protargol, with cold applications and, perhaps, hourly cleansing with a solution of permanganate of potassium, both in the hands of the laity, can completely take the place of nitrate of silver in the treatment of blennorrhœa neonatorum.

URATA (153, Experimental investigations of the value of Crede's drops) demonstrated on rabbits' eyes that a $\frac{1}{2}$ % solution of nitrate of silver is sufficient for the gonococci and therefore recommends a 1 % solution to be used in practice as less irritating to the eye than a 2 %.

RAEHLMANN (154, Trachoma : Histological, ultramicroscopical, and physiologico-chemical studies) brings forward new facts which he has obtained partly through his histological, but more through his ultramicroscopical, researches. He also tries to explain the action of astringents in trachoma. He recognizes follicular conjunctivitis to be a mild form of trachoma, as there is no anatomical difference in the follicles.

PETERS (155, Further remarks on trachoma and on the treatment of chronic diseases of the conjunctiva) repeats his deductions regarding trachoma. He considers the color characteristic of the follicles ; that this color indicates the presence of adenoid tissue, and that the latter is the characteristic of trachoma. This, and not the follicles, possesses the tendency to scar formation. The adenoid tissue can be present without follicles, and for the purposes of a careful diagnosis a piece should be excised and examined microscopically. Such cases he believes to be an abortive form of trachoma. He advises mechanical treatment of conjunctival diseases with increased adenoid tissue, with little papillary swellings, and in conjunctivitis sicca. If Peters's views regarding the importance of adenoid proliferation in the conjunctiva are correct, no prophylaxis is possible.

GREITZ (158, Ambulatory mechanical treatment of trachoma) treated 312 trachomatous soldiers by squeezing out the trachoma granules with as little injury as possible to the sound conjunctiva. The conjunctival sac was washed out before the operation with a 2:1000 solution of mercuric cyanide, afterward with a 2:10,000 solution of either mercuric chloride or cyanide, and iodoform ointment was introduced. Later bluestone, alum, or silver nitrate was applied. The duration of treatment was, in mild cases, from three to five weeks ; in the moderately severe cases,

two to three months. Eighty per cent. of these cases recovered. This treatment is not applicable to severe cases.

HIRSCHMANN.

WASSJUTINSKY (159, X-ray treatment of trachoma) used the X-rays in seven cases of trachoma. His conclusions are that trachoma is influenced by the X-rays beyond a doubt. The infiltration diminishes, the granules slowly become smaller, pannus disappears quickly and completely, and the subjective symptoms of pain are relieved. He did not obtain a perfect cure in a single case. The cicatricial formation is insignificant. The milder forms of trachoma, without deep infiltration, yield more readily to the usual methods of treatment than to the X-rays. Treatment by the X-rays is painless and followed by no bad after-results. Improvement can be obtained in severe cases which resist obstinately the usual treatment.

HIRSCHMANN.

In the clinic at Moscow two cases of pemphigus conjunctivæ were observed among 38,000 patients. MAKRAKOW [160, Essential contraction of the conjunctiva (pemphigus conjunctivæ)] reviews the literature on the subject and questions the correctness of the identification of this disease with pemphigus, because the bullæ of true pemphigus leave cicatrices neither on the skin nor mucous membranes, but only pigmentation, while the contrary is true in this conjunctival disease. Moreover, sometimes no bullæ are observed in this disease. The contraction of the conjunctiva and the resultant consequences form its characteristics. In the case observed by the author there was ptosis of the right eye, narrowing of the palpebral fissure to 0.5 cm, great diminution in the size of the upper part of the conjunctival sac, and three bands which bound the lower lid fast to the globe. There was a pterygium-like formation on the lower part of the cornea. The lacus lachrymalis and the caruncula were absent as a result of the ankyloblepharon. All these symptoms were still more marked in the left eye, and the cornea was covered with a pannus-like layer. The vision was very slight. Maklakow separated the lower lid from the left eye, formed a lower conjunctival pouch from 0.5 to 1 cm deep, and lined it with a membrane taken from a fresh-egg shell, which was removed at the end of twelve days. A lower fornix was thus re-formed and motility restored to the eyeball. The vision improved to fingers at $\frac{1}{2}$ m. The author hopes the result will be permanent.

HIRSCHMANN.

The case described by DE SCHWEINITZ and SHUMWAY (161, Conjunctivitis nodosa with histological examination) had the appearance of tuberculosis of the conjunctiva. There were a number of grayish-yellow nodules in the bulbar conjunctiva associated with some conjunctivitis. The tissue was excised, and when examined with the microscope each nodule was found to contain in its centre a hair surrounded by round-cell infiltration. Bacterial infection was absent. Children are at times in the habit of playing with caterpillars, and in this case had been throwing them at one another. Undoubtedly the hairs of the *Spilosoma virginica* or "woolly bear" caterpillar were thus introduced into the conjunctiva.

ALLING.

WÜRDEMANN (162, Ophthalmia nodosa) relates two cases of hypertrophy of the conjunctiva due to the presence of a bee-sting and a part of the antennæ of a grasshopper, which he called ophthalmia nodosa.

ALLING.

There seems to be some peculiarly irritating quality in the ordinary copying or indelible aniline pencil. RAY (163, Injuries to the eye from particles of a copying pencil getting into the conjunctival sac; report of two cases) recites two cases in which small pieces of the point lodged in the conjunctival sac. In one the reaction was severe, terminating in corneal opacities and symblepharon.

ALLING.

KAYSER (164, Injuries to the eyes from the larvæ of flies) removed from the conjunctival sac of a child some larvæ which had been deposited there by a fly. The temporal portion of the conjunctiva was reddened, swollen, studded with large and small follicles, and excreting a little thin mucus.

GRUNERT (165, Operation in total symblepharon of both lids to form a cavity for an artificial eye) uses for the formation of the conjunctival sac both pediculated and non-pediculated flaps of mucous membrane and of skin. He allows the flaps to heal to the lids, which have been turned out after the outer canthus has been divided by two divergent incisions which, at the end of three weeks, are to be reunited over a glass eye. If any islands of mucous membrane or skin remain in the conjunctival sac, they are used to cover the posterior pole. In this way he found in one case only two operations necessary.

GULLSTRAND (166, Building up of the fornix with supported flaps of epidermis) considers it important that not a thread of

cicatricial connective tissue which may bring about a subsequent contraction be left in the new fornix. He transplants a single large flap of epidermis, supports it with a guttapercha disk, and temporarily sutures the lids together.

HOTZ (167, The use of Thiersch's skin flaps in the operation for total symblepharon) always operates separately on the upper and lower fornix, takes flaps of epidermis from the arm and fixes them by means of plates of lead. They are sutured to the margin of the lower lid. In dealing with the upper lid they must be sufficiently large to fill the entire conjunctival sac. An aperture is left for the cornea. The lids remain closed four days. The plates are used for a week, but are removed for the purpose of cleansing.

HERBERT [168, Two cases of colloid (hyaline) degeneration of tarsus and conjunctiva] observed in two Hindoo women a marked thickening of the tarsus of the upper lid with a yellowish discoloration of the waxy conjunctiva. Anatomical investigation revealed colloid degeneration, combined, in one case, with calcification and ossification.

ABELSDORFF.

COSMETTATOS (169, Papilloma of the bulbar conjunctiva with involvement of the cornea) reports a case of papilloma of the bulbar conjunctiva of a woman thirty-six years old, which later assumed a malignant character, involved the cornea, and rendered enucleation necessary. Only two cases have hitherto been reported of extension of a papilloma of the conjunctiva to the cornea.

BERGER.

XII.—CORNEA, SCLERA, ANTERIOR CHAMBER.

170. ENGELMANN, L. Hyaline degeneration of the cornea. *Zeitschr. f. Heilk.*, xxvi., 1905, 4, p. 202.

171. VEASEY, C. F. A. Report of two cases of family macular degeneration of the cornea. *Trans. Amer. Ophth. Soc.*, 1904.

172. NOVON. Primary band-shaped opacities of the cornea. *Ned. Tijdsch. v. Geneesk.*, 1905, 1, No. 3.

173. KOLL. A case of brown discoloration of the cornea from chromium. *Zeitschr. f. Augenheilk.*, xliii., 3, p. 220.

174. MELLER, J. Keratitis punctata leprosa. *Kl. Monatsbl. f. Augenheilk.*, xliii., 1, p. 66.

175. SPICER, HOLMES. Keratitis profunda. *Report of the Ophthalmic Section of the British Med. Assn.*, 1904.

176. VOSSIUS, A. Keratitis parenchymatosa annularis. *Arch. f. Ophth.*, lx., 1, p. 116.

177. V. REUSS, A. The treatment of keratitis. *Allgemeine Wiener mediz. Zeitung*, 1905, I, 3, and 4.
178. GALEZOWSKI, JEAN. Neuro-paralytic keratitis. *Recueil d'ophtal.*, xxvii., p. 146.
179. OSTERROHT. Keratomycosis aspergillina. *Berl. klin. Wochenschr.*, 1905, No. 7, p. 173.
180. PAUL, L. Ulceration of the cornea from diplobacilli. *Klin. Monatsbl. f. Augenheilk.*, xliii., I, p. 154.
181. PAUL, L. Serum therapy, particularly in ulcer serpens corneae. *Klin. Monatsbl. f. Augenheilk.*, xliii., I, p. 54.
182. SZCZYBALSKI. A case of corneal ulcer from infection with the bacillus pyocyaneus. *Arch. f. Augen.*, li., 3, p. 249.
183. HOLMSTROM. Treatment of purulent keratitis. *Hygeia*, 1905, I, p. 273.
184. DE LAPERSONNE. Collargol in purulent inflammation of the cornea. *La presse médicale*, 1905, No. 36.
185. VAUCLEROY. Unguentum Crede in ophthalmology. *Rec. d'ophtal.*, 1905, No. 2.
186. ANTONELLI. Ulcerous syphilide of the cornea. *Soc. d'ophtal. de Paris*, Jan. 10, 1905.
187. VINSONNEAU, C. Syphilitic gumma of the cornea. *Arch. d'ophtal.*, xxv., p. 104.
188. FEILCHENFELD, H. Prophylaxis of the recurrence of erosions of the cornea. *Deutsche med. Wochenschr.*, 1905, 8, p. 425.
189. BEDELL, A. J. Corneal laceration with cilia in the anterior chamber. Pupillary occlusion. Four operations. Recovery. *Annals of Ophth.*, Jan., 1905.
190. EVANS, THOMAS. Hydatid cyst of the anterior chamber. *Ophthalmoscope*, Jan., 1905.
191. LOPEZ. Treatment of pterygium. *Rec. d'ophtal.*, xxvii., p. 78.
192. LAUBER, H. Peripheral ectasia of the cornea. *Klin. Monatsbl. f. Augenheilk.*, xliii., I, p. 382.
193. WICKERKIEWICZ. Primary keratoconus. *Zeitschr. f. Augenheilk.*, xliii., 2, p. 93; also *Arch. d'ophtalmologie*, xxv., p. 87.
194. STOCK, W. The secretion of the aqueous after puncture of the anterior chamber. *Klin. Monatsbl. f. Augen.*, xliii., I, p. 86.
195. STEPHENSON, SYDNEY. Traumatic keratitis in the new-born. *Ophthalmoscope*, Jan., 1905.

ENGELMANN (170, Hyaline degeneration of the cornea) stained the products of degeneration in the cornea red with saffranin. He excluded colloid, amyloid, and glycogenous substances by the physical peculiarities, the microchemical reactions, and the staining of the products of degeneration, and proved them to be hyaline. The patients had suffered for years from a chronic superficial keratitis. Hyaline had developed in one case in the deeper tissue layers, in the other just beneath the epithelium also. In the first case, the pathological changes were compara-

tively slight. In the second case, the subepithelial tissue had numerous branching outgrowths, was quite vascular, and Bowman's membrane had completely disappeared. Giant cells took part in producing this atrophy.

VEASEY (171, Report of two cases of family macular degeneration of the cornea) had two cases characterized by progressive opacity of both corneæ beginning about the tenth or twelfth year and leading to blindness. They are similar to those already described and named by Fehr.

ALLING.

Most cases of band-shaped keratitis are secondary to either cyclitis or chronic glaucoma. In NOYON'S (172, Primary band-shaped opacities of the cornea) case the cornea presented a band-shaped opacity extending from right to left, while the periphery was clear. The corneal epithelium was intact and there were no signs of inflammation. The patient had arteriosclerosis. Most authors suppose that in band-shaped keratitis there is a deposit of calcium salts between the substantia propria and Bowman's membrane. Leber ascribes its formation to evaporation of the fluid in the palpebral space when the blood-vessels are diseased and the blood contains much salt. The differentiation between primary and secondary band-shaped keratitis is purely clinical.

JITTA.

KOLL'S (173, A case of brown discoloration of the cornea from chromium) patient caused the discoloration of the cornea with chromium, the conjunctiva remaining unaffected, by constantly rubbing his eyes with dirty fingers or rags. There was a little ulcer and a slight loosening of the epithelium. The discoloration did not disappear from the cornea. This condition could be produced experimentally only when the cornea was exposed to the sunlight after instillation of a 5% solution of bichromate of potassium. Koll experimented also with anilin, the warm vapor of which produced transient changes in the cornea.

A patient with lepra had a diffusely opaque cornea with little gray nodules. MELLER (174, Keratitis punctata leprosa) removed some of these nodules and found that they contained great quantities of lepra bacilli.

V. REUSS (177, The treatment of keratitis) endeavors to bring about absorption of the infiltrating cells in keratitis by dilatation of the blood and lymph channels. This is secured by reduction of the intraocular tension, partly by eserine, partly by atropine.

Secondly by the application of a bandage to prevent friction of the cornea ; when this is contra-indicated by the presence of pus or eczema, the application of an ointment suffices. Third, the intraocular tension may be reduced by means of paracentesis. He also uses heat, dionin in large doses, and subconjunctival injections of salt solution to obtain dilatation of the vessels. Fasicular keratitis alone is treated differently, by section of the vessels and cauterization of the ulcer. The pain and photophobia which usually accompany corneal disease v. Reuss treats with the faradic current. If a prolapse of the iris is large and fresh, he excises it, otherwise he leaves it alone.

In GALEZOWSKI'S (178, Neuro-paralytic keratitis) case, a neuro-paralytic keratitis with iritis and hypopyon followed the application of a hot eye-bath in a woman who had suffered for three or four years from monolateral paralysis of the trigeminus. The abrasion of the epithelium was followed by atrophic ulcer of the cornea which finally healed leaving a scar.

BERGER.

In OSTERROHT'S (179, Keratomycosis aspergillina) case the hypopyon disappeared after two days of medical treatment, but the corneal inflammation did not recover until after the fungi had been removed.

PAUL (180, Ulceration of the cornea from diplobacilli) produced extremely severe ulcers of the cornea with hypopyon, iritis, chemosis, and great pain, by means of diplobacilli. These ulcers differed from the serpiginous, not only in the bacilli, but also in the absence of any undermining of the margin, and they extend correspondingly slower. The infiltration was also usually more uniform, the ulcer more disk-shaped. Infiltration of the vitreous was rare. It was not accompanied by dacryocystitis, but was by a very persistent conjunctival catarrh. Usually there is a previous injury of the cornea. Nearly all these ulcers recover under treatment with zinc without cauterization. These constitute more than a third of all corneal ulcers.

PAUL (181, Serum therapy, particularly in *ulcus serpens corneæ*) used Roemer's pneumococcus serum in patients with *ulcus serpens* with perfect result in 18 %, partial in 27 %. He thinks it probable that the serum is not always equally strong. The harmlessness of the serum has not yet been sufficiently

established, and the immunization is too short for it to be used as a prophylactic against the relatively rare *ulcus serpens*.

SZCZYBALSKI (182, *A case of corneal ulcer from infection with the bacillus pyocyaneus*) found the *bacillus pyocyaneus* in a large superficial ulcer of the cornea, which healed quickly after cauterization. Elsewhere this appears only as a harmless parasite on other pus agents. But in the eye it often has a specially virulent character, and may cause a rapid suppuration.

DE LAPERSONNE (184, *Collargol in purulent inflammation of the cornea*) has used collargol for about a year in all forms of purulent keratitis, of whatever origin, and in infected wounds of the cornea. He has also seen a hypopyon accompanying iritis of internal origin disappear in a few hours after the intravenous injection of collargol. The great advantage of collargol over silver nitrate consists in its painlessness and in the fact that it leaves no deposit in the cornea. The effect of its application is an immediate decrease of the pain and photophobia. In a few days the ulcer becomes clean, the hypopyon lessens and disappears, and healing takes place with the minimum of cicatricial formation. The instillation of two drops of a 5 % solution every two or three hours, or two or three times a day, is to be continued until complete recovery. It does not do away with the need of antiseptic irrigation, or the use of small doses of atropine, cauterization, or paracentesis of the anterior chamber for a large hypopyon, with subsequent irrigation with collargol. Simultaneous treatment of the lachrymal passage, including injections of collargol, is necessary.

VAUCLEROY (185, *Unguentum Crede in ophthalmology*) treated a traumatic ulcer of the cornea with hypopyon, which had lasted three weeks and had become infected by a blennorrhœa of the lachrymal sac, with a daily inunction of unguentum Crede, collargol ointment, about the orbit and eyelids. Every trace of pus had disappeared at the end of four days. He had also seen improvement and recovery in several cases of threatened panophthalmitis, and in one case of suppuration after tenotomy, follow the use of collargol.

FEILCHENFELD (188, *Prophylaxis of the recurrence of erosions of the cornea*) thinks that injuries of the cornea which show a tendency to recurring erosions, those made with finger nails,

hairs, etc., are infected. The best plan would be to cauterize, but it is usually sufficient to scrape and disinfect.

EVANS'S (190, Hydatid cyst of the anterior chamber) patient was a child aged six, who was at Sydney, N. S. W. Floating in the anterior chamber of the left eye was a pearly-white cyst, apparently unattached. The cyst was extracted in much the same manner as a cataract, and the child recovered. On examination no hooklets or brood capsules were found, but the cyst wall was characteristic, and was not at all like that found in cysticercus.

MARSHALL.

LAUBER (192, Peripheral ectasia of the cornea) describes an ectasia which involved about a third of the margin of the cornea and gave the impression that the cornea was stretched in the region of an arcus senilis or a marginal ulcer. As both of these conditions were absent, the cause seemed to be a chronic mild inflammation which had thinned that portion of the margin.

WICHERKIEWICZ (193, Primary keratoconus) considers the cause of primary keratoconus to be an interference with the nutrition of the cornea, which is in turn dependent on a fault of the general condition. The apex of the keratoconus is usually directed downward and inward. The pressure of the lids influences the shape of the cornea, and explains the peculiar position of the apex. Seven cases are reported.

BERGER.

On opening the anterior chamber for the purpose of performing an iridectomy for visual purposes, STOCK, (194, The secretion of the aqueous after puncture of the anterior chamber) saw the iris, which had been occupying its normal position, suddenly protrude forward. His explanation is that an energetic secretion of aqueous suddenly took place behind the iris.

After mentioning the recorded cases of this condition, STEPHENSON (195, Traumatic keratitis in the new-born) sums up as follows: "(1) that practically all have followed a difficult instrumental delivery; (2) that one eye alone is generally affected; (3) that they are associated with other signs of traumatism, as abrasions of the skin, bruises, subconjunctival or retinal hemorrhages, hyphæma, etc.; and (4) that a more or less characteristic form of corneal opacity is usually present."

Stephenson then records a case that recently occurred at Queen Charlotte's Lying-in-Hospital. Although there are, on an average,

1200 births there a year, and forceps are applied in fully 10 % of the cases, and a careful look-out has been kept for them, yet this is the first case that has been seen. The mother was aged forty-one, and had a small round pelvis. Considerable difficulty was experienced in delivery with forceps, and one blade was applied over the outer angle of the left orbit. Much bruising was found above the left frontal bone, and the eyelids were considerably swollen. The next day the cornea was found to be uniformly steamy, and there was a subconjunctival hemorrhage. The anterior corneal epithelium was stippled. There was at no time any discharge from the eye. Ten days later the only evidence of injury was a small linear opacity lying vertically in the outer part of the cornea. Three months after birth the condition remained unchanged. Stephenson also records a second case occurring in a child aged twelve. The appearance was characteristic, and on inquiry it was found that at birth forceps were used and the child's head was much injured by them, the scars of which remained visible. Much irregular astigmatism was present.

MARSHALL.

Sections XIII.—XVIII. Reviewed by DR. O. BRECHT, Stettin.

XIII.—LENS.

196. LAGRANGE, FELIX, and AUBARET. Intraocular lavage in the operation for cataract. *Arch. d'ophtalmologie*, xxv., p. 73.

197. DE WECKER, L. Recent attempts to cure cataract without operation. *Annales d'oculistique*, cxiii., p. 161.

198. DESBRIÈRES and BARGY, MAURICE. A case of cataract caused by an electric discharge. *Annales d'ocul.*, cxxxiii., p. 118.

199. BAHR, Ripening of, and operations on, cataract. *Münch. med. Woch.*, 1905, I, p. 313.

200. HARMS, CL. (Breslau). Spontaneous resorption of senile cataract in the closed capsule. *Klin. Monatsbl. f. Augenheilk.*, xliii., I, p. 147.

201. ZIRM, E. (Olmütz). Our present knowledge regarding the nutrition and disturbances of nutrition of the lens. *Wien. klin. Wochenschr.*, 1905, No. 12.

202. ROURE. Two cases of ossification of the lens. *Revue gén. d'opht.*, xxiv., p. 49.

203. MORAX, V. Metallic foreign body in the lens. Extraction with the electro-magnet. Recovery without cataract. *Annales d'oculistique*, cxxxiii., p. 122.

204. FRACHTMANN, H. Indirect injury of the sphincter iridis, subluxation of the lens, and anterior cortical cataract from contusion of the eyeball. *Wien. med. Wochenschr.*, 1905, No. 10.

205. LEBER, TH. The pathogenesis of cataract. *Klin. Monatsbl. f. Augenheilkunde*, xliii., p. 324. (Polemical.)

LAGRANGE and AUBARET (196, Intraocular lavage in the operation for cataract) consider that the attempts hitherto made to perform intraocular lavage after extraction of cataract could not be productive of good results because the instruments employed were impractical and because irritating antiseptic fluids were used. They consider Chibret's syringe as modified by Aubaret the only proper instrument which can be used for injection and aspiration simultaneously. A sterilized artificial aqueous should be used for injection. The results are very good in juvenile, soft, and traumatic cataract. It is of no use in phakosclerosis. They have performed one hundred lavages after cataract extraction without the least accident or loss of vitreous. They do not recommend this method in imbecile patients.

BERGER.

XIV.—IRIS.

206. STRAUB (Amsterdam). **Cyclitis.** *Ned. Tijdschr. v. Geneesk.*, vol. I, No. 5, 1905.

207. DE LAPERSONNE, F. Does there exist a blennorrhagic iritis? *Arch. d'ophtal.*, xxv., p. 137.

208. SONDER. **Blennorrhagic iritis.** *La clinique ophtalm.*, 1904, p. 373.

209. GALEZOWSKI. **Gonorrhœal irido-choroiditis.** *Le progrès médical*, 1905, p. I.

210. POYNTON. Some observations upon the pathogenesis of rheumatic iritis. *Ophthalmoscope*, 1905, p. 123.

211. POSEY, W. C. Intraocular tuberculosis with report of two cases. *Trans. Amer. Ophthal. Soc.*, 1904.

212. KUTHE and GINSBERG. **Epithelioma of the ciliary body in a child five years old.** *Festschrift an Prof. Hirschberg*.

213. KNAPP, H. **Syphiloma of the ciliary body.** *Four. Amer. Med. Assn.*, Jan. 14, 1905.

214. ALLING, A. N. A congenital intraocular tumor containing epithelium and cartilage. *Trans. Amer. Ophth. Soc.*, 1904.

215. MOISSONNIER. **Leucosarcoma of the ciliary body.** *Arch. d'ophtal.*, xxv., p. 144.

216. POULARD. **Melanosarcoma of the iris.** *Soc. d'opht. de Paris*, Feb. 7, 1905.

217. BEDNARSKI, ADAM. Pathological changes in the zonule of Zinn. *Arch. f. Augenh.*, li., p. 227.

218. GILBERT, W. (Bonn). Two cases of rare congenital anomalies of the iris. *Zeitschr. f. Augenheilk.*, xliii., 2, p. 144.

219. ENSLIN, EDUARD (Erlangen). A hitherto undescribed malformation of the iris. *Arch. f. Augenh.*, li., p. 346.

According to STRAUB (206, Cyclitis), when the ciliary body of an animal has been infected, an infiltrate appears at the place of infection, exudates are formed in the ciliary body, the optic nerve, and the retina, and there are frequently signs of Descemetitis and iritis. An affection of the ciliary body cannot be pointed out, but it may be assumed that the ciliary body is the principal seat of an inflammation if all the neighboring membranes, the sclera, cornea, iris, and choroid, are involved. Opacities appear in the vitreous, particularly about the pupil and near the retina.

JITTA.

DE LAPPERSONNE (207, Does there exist a blennorrhagic iritis?) is of the opinion that the existence of an iritis due to blennorrhœa of the urethra has not yet been demonstrated. In none of the cases hitherto observed have gonococci been found in the aqueous. The variety of the clinical symptoms is opposed to any one etiology of this iritis, which is probably caused by secondary infection by staphylococci or other pathogenic microbes, or by the rekindling of a rheumatic affection. He quotes two interesting clinical histories in support of his views. He recommends for general treatment in these cases of iritis injections of pilocarpine, salicylate of soda, pyramidon, and preparations of colchicum.

BERGER.

POSEY (211, Intraocular tuberculosis with report of two cases) had one case of solitary tubercle of the iris in which tubercle bacilli were found and another of solitary tubercle of the choroid just posterior to the ora serrata associated with miliary tuberculosis of the iris. In both instances there was no evidence of lesions in other parts, either before or after enucleation.

ALLING.

In KNAPP'S (213, Syphiloma of the ciliary body) case the syphilitic tumor perforated the sclerotic in the upper part near the corneal periphery. Treatment with mercury, atropine, and bed-rest cured the disease, with recovery of normal vision and an unmutated globe.

ALLING.

The tumor described by ALLING (214, A congenital intraocular tumor containing epithelium and cartilage) arose from the root of the iris and ciliary body, and consisted of undifferentiated tissue and endothelial (or epithelial) cells. There was also in the centre of the tumor an area of hyaline cartilage.

ALLING.

BEDNARSKI (217, Pathological changes in the zonule of Zinn)

reviews what is known of the pathological condition of the zonula and adds six investigations of his own. He confirms the view that thickening of the fibres of the zonula corresponds to atrophy of the fibres (bad staining, homogeneous appearance, hyaline degeneration), and this goes hand in hand with partial atrophy of the ciliary body.

One of GILBERT'S (218, Two cases of rare congenital anomalies of the iris) cases was a monolateral partial irideræmia, the other a monolateral multiple notching of the margin of the pupil.

ENSLIN (219, A hitherto undescribed malformation of the iris) saw an entropion of the iris with no other changes in a cadaveric eye. The pigment layer ended 0.4mm from the pupil, the pupillary margin lay back so that the sphincter formed a U-shaped curve. A ridge protruded from the pigment layer from which fibrous bands of the stroma extended in a fan-like form. The author is of the opinion that the condition was the result of intra-uterine changes.

XV.—CHOROID.

220. FISH, H. M. Some cases of uveitis due to accessory sinus disease. *Amer. Jour. of Ophth.*, Dec., 1904.

221. CHAILLONS. Metastatic choroiditis with scleral perforation and subconjunctival abscess. Diagnosis of the origin of the suppuration by the microscopic examination of the pus. *Soc. d'ophth. de Paris*, Feb. 7, 1905.

222. POOLEY, T. R. A case of conglomerate tubercle of the choroid. *Trans. Amer. Oph. Soc.*, 1904.

223. DE SCHWEINITZ, G. E., and SHUMWAY, E. A. Tuberculosis of the choroid. Perforation of the sclera. Extension posteriorly with involvement of the optic nerve. Histological and bacteriological examination of the specimen. *Ophth. Record*, Dec., 1904.

FISH (220, Some cases of uveitis due to accessory sinus disease) offers six cases in proof of his belief that disease of the frontal sinus is a frequent cause of inflammation of the uveal tract without involvement of the orbit. ALLING.

XVI.—VITREOUS.

224. FEJER, JULIUS. Bilateral hemorrhage into the vitreous. *Centrl. f. prakt. Augenheilk.*, xxix., p. 10.

225. ELSCHNIG (Vienna). Hæmolytic injections in recurrent hemorrhages into the vitreous. *Arch. f. Augenheilk.*, li., p. 354.

226. KIPP, C. J. An uncommon congenital anomaly in the vitreous chamber and the inner membranes of both eyes. *Trans. Amer. Oph. Soc.*, 1904.

FEJER (224, Bilateral hemorrhage into the vitreous) treated a man thirty-three years old who had large hemorrhages in the vitreous of both eyes, probably of specific origin.

ELSCHNIG (225, Hæmolytic injections in recurrent hemorrhages into the vitreous) was induced to try an injection of hæmolyisin in an eye almost blind from recurring vitreous hemorrhages by Roemer's demonstration at the Congress at Heidelberg in 1903. After removing a certain quantity of the fluid vitreous, he injected an equal quantity of sterilized immune serum of rabbits. The result was bad. The eye had to be enucleated because of the increased tension and unbearable pain with complete amaurosis, and the pathological examination showed a plastic iridocyclitis and necrosis of the vitreous and retina. In spite of this unfortunate result the author does not look upon Roemer's method as hopeless, but recommends that the hæmolytic serum be thinned with physiological salt solution to eliminate other cytotoxic components, to replace only a portion of the fluid vitreous removed to prevent the increase of tension, and, in case the latter does occur, to perform paracentesis of either the anterior chamber or of the vitreous.

KIPP (226, An uncommon congenital anomaly in the vitreous chamber and the inner membranes of both eyes) shows a case probably of persistent retinal artery associated with a narrow coloboma of the choroid extending outward. Retinal vessels follow the course of the cleft.

ALLING.

XVII.—GLAUCOMA.

227. FRENKEL, HENRI. Studies of the arterial tension in glaucoma. *Arch. d'opht.*, xxv., p. 27.

228. LAMBERT, W. E. A case of simple glaucoma with some unusual features. *Trans. Amer. Ophth. Soc.*, 1904.

229. KILICK. Acute glaucoma occurring simultaneously in both eyes. *British Med. Jour.*, 1904, 2, p. 1517.

230. URIBE Y TRONCOSO. Experimental studies regarding the filtration of saline and albuminous fluids which traverse the anterior chamber, and its part in the production of glaucoma. *Ann. d'ocul.*, cxxxiii., p. 5.

231. DIANOUX. Glaucoma and sclerotomy. *Annales d'oculistique*, cxxxiii., p. 81.

232. ABADIE, CH. Glaucoma and sclerotomy. *Ibid.*, p. 202. (Polemical article combating Dianoux's opinion.)

233. SENN. A warning against the unrestricted use of adrenalin in glaucoma. *Wochenschr. f. Therapie u. Hyg. d. Auges*, 1905, No. 17.

234. REIS, W. Investigations regarding the pathological anatomy and the pathogenesis of congenital hydrophthalmos. *Arch. f. Ophth.*, lx., 1, p. 1.

FRENKEL (227, Studies of the arterial tension in glaucoma) shows the clinical frequency of arteriosclerosis and the great variability of the arterial tension, from 2 to 15 mm. In 14 out of 15 cases the arterial tension was increased, though not to so high a degree as in albuminuric retinitis. Zimmermann's theory, that a reduction of the arterial tension may favor an attack of glaucoma, he considers incorrect. The quantity of NaCl present he does not find to have any influence on the glaucoma. The excretion of methyl blue through the kidneys is retarded in glaucoma, though not so much as in cataract. His conclusion is that the increase in the arterial tension plays an important part in the pathogenesis of glaucoma.

BERGER.

A case with a record of physiological excavation later appeared with glaucoma simplex. LAMBERT (228, A case of simple glaucoma with some unusual features) questions whether a physiological excavation has any relation to pathologic cupping. Cupped disk in glaucoma is for the most part mechanical and due to high tension, hence if this patient formerly had excavation it was either pathologic or a coincidence.

ALLING.

DIANOUX (231, Glaucoma and sclerotomy) is of the opinion that sclerotomy is productive of good results in glaucoma when it is performed so as to leave a filtration cicatrix, while if the latter is not formed a sclerotomy acts only as a paracentesis of the anterior chamber. For four or five days after a sclerotomy he gently massages the eye in order to re-open the wound and allow of the escape of part of the aqueous, and at the same time uses collyria containing eserine, pilocarpine, cocaine, and adrenalin. At the end of a week the patients are discharged and advised to maintain the methodical use of myotics and massage of the eye.

BERGER.

REIS (234, Investigations regarding the pathological anatomy and the pathogenesis of congenital hydrophthalmos) gives an accurate anatomical description of seven cases of infantile glaucoma. In four, the filtration angle was open, but Schlemm's canal more or less stenosed or completely closed; in three, the filtration angle was obliterated. The pathogenesis is not the same in all cases. In the majority, abnormal conditions at the filtration angle prevent the normal exit of the fluid secreted, and these are

frequently to be found in Schlemm's plexus. The obliteration of Schlemm's canal may be ascribed to inflammation, or to congenital faults of development. In many cases this obliteration is the one demonstrable anatomical change, which shows it to be of great etiological importance.

XVIII.—SYMPATHETIC OPHTHALMIA.

235. STEINDORFF. The frequency and curability of sympathetic ophthalmia. *Festschrift an J. Hirschberg*.

236. GOLOVINE, L. L. The importance of cytotoxines in ocular pathology, and particularly in the pathogenesis of sympathetic inflammation. *Archives d'ophtalmologie*, xxv., p. 98.

237. SATTLER, R. Sympathetic neuro-retinitis and serous uveitis following enucleation with transplantation of glass globe; resection of the optic nerve; recovery. *Trans. Amer. Ophth. Soc.*, 1904.

GOLOVINE (236, The importance of cytotoxines in ocular pathology, and particularly in the pathogenesis of sympathetic inflammation) thinks that the cytotoxic theory alone can explain the pathogenesis of sympathetic ophthalmia. He injected an emulsion of the ciliary body and iris of a dog into the peritoneum of a rabbit. The blood serum of the last rabbit was injected locally into the eye of a dog, where it produced a slight inflammation with circumcorneal injection and deposits on Descemet's membrane. Intravenous injection of the cytotoxic serum produced no macroscopic change in the eye, but microscopically there were found in the ciliary body a fibrinous subepithelial exudate, swelling and vacuolization of the epithelial cells of the pars ciliaris retinae, and atrophy of pigment in the pigment cells. The author assumes that a toxin which affects the ciliary body alone (cyclo-toxine) and a lysin affecting the pigment (pigmento-lysin) are contained in the cytotoxine. He considers that the theory of the cytotoxine can also explain many other diseases of various parts of the eye when cytotoxines are produced by cell destruction and at the same time the normal antitoxic functions are weakened.

SATTLER (237, Sympathetic neuro-retinitis and serous uveitis following enucleation with transplantation of glass globe; resection of the optic nerve; recovery) reports a case in which, forty-eight days after implantation of an artificial globe, pronounced neuro-retinitis with serous uveitis was discovered. Vision was reduced to movements of the hand. Two and one-half centimetres of the optic nerve were resected and the eye rapidly recovered.

ALLING.

Sections XIX.—XXII. Reviewed by DR. H. MEYER,
Brandenburg.

XIX.—RETINA AND FUNCTIONAL DISTURBANCES.

238. V. GEUNS, J. R. A rare and peculiar retinal affection. *Ned. Tijdschr. v. Geneesk.*, Bd. I, No. 3, 1905.
239. JACOBY, E. Another case of retinal disease with formations resembling aneurysms on the retinal vessels. *Klin. Monatsbl. f. Augenheilk.*, xliii., 1, p. 137.
240. HARMS, A. Occlusion of the trunk of the central vein of the retina. *Ibid.*, p. 143.
241. GONIN, J. Re-establishment of the retinal circulation by anastomosis following obstruction of the central artery. *Annales d'oculistique*, cxxxiii., p. 167.
242. CRAMER, E. Traumatic detachment of the retina of tardy appearance. *Zeitschr. f. Augenheilk.*, xiii., 1, p. 22.
243. ZASKIN, A. Detachment of the retina. *Westn. Ophth.*, 1905, 1.
244. WESSELY, K. Action of the pressure bandage in detachment of the retina. *Klin. Monats. f. Augenheilk.*, xliii., 1, p. 654.
245. SATTLER, H. Treatment of detachment of the retina. *Deutsche med. Wochenschr.*, 1905, Nos. 1 and 2.
246. VERHOEFF, F. H. A rare tumor arising from the pars ciliaris retinae (terato-neuroma), of a nature hitherto unrecognized, and its relation to the so-called glioma retinae. *Trans. Amer. Ophth. Soc.*, 1904.
247. PARSONS, HERBERT. A case of glioma retinae in a shrunken globe. *Royal London Ophth. Hosp. Rep.*, xvi., 2, p. 141.
248. WEHRLI, E. The relation of the retinal hemorrhages which occur during birth to the pathogenesis of glioma retinae. *Correspondenz-Blatt f. Schweizer Aerzte*, 1905, No. 2.
249. ASCUNCE. Glioma of the retina. *Annales d'oculistique*, cxxxiii., p. 85.
250. HANCOCK, ALBERT. A case of tubercle (?) of the retina. *Royal London Ophthalmic Hospital Reports*, xvi., 2, p. 150.
251. HIRSCH, C. Pigmentation of the retina. Berlin, 1905.

Prompted by the publication of v. Hippel's "Two rare cases of retinal disease," JACOBY (239, Another case of retinal disease with formations resembling aneurysms on the retinal vessels) reports an analogous case in which the eyes gradually became blind. Tuberculosis and syphilis were excluded. Ophthalmoscopically there were on the right side optic atrophy and two enormously dilated vessels, an artery and a vein, which presented the appearance of a red tumor. The artery seemed broken in many places, and at these places was somewhat swollen and again constricted. A similar condition was present on the left side, except that here there were three such masses, which were more yellowish

centrally. No hypothesis was advanced as to the nature of the disease.

HARMS (240, Occlusion of the trunk of the central vein of the retina) adds four cases to the five already known of pure, complete occlusion of the trunk of the vein, which have been investigated anatomically. They presented the clinical pictures of hemorrhagic retinitis with subsequent glaucoma, or of hemorrhagic glaucoma. They represent four different anatomical possibilities in the way of venous occlusion. 1. Marantic thrombosis. 2. Thrombosis on the farther side of a narrowed place in an almost normally large lumen, at all events through the formation of a whorl with slight disturbance of the circulation. 3. Primary meso- and endophlebitis. 4. Thrombosis due to a pre-existing endophlebitis.

GONIN'S (241, Re-establishment of the retinal circulation by anastomosis following obstruction of the central artery) case was one of sudden blindness with symptoms of obstruction in the central artery of the retina in a woman sixty-four years old. A collateral circulation was established through a number of little arteries which came from the papilla and joined with branches of the central artery. Nettleship has reported a similar case. Gonin supposes that in both cases the very fine anastomotic twigs between the branches of the central artery and those of the short posterior ciliary arteries described by Leber were more superficial than usual and could be seen with the ophthalmoscope.

BERGER.

CRAMER (242, Traumatic detachment of the retina of tardy appearance) reports a case in which a blow from a flail was received on the upper-inner margin of the orbit and the corresponding quadrant of the eyeball. A laceration of the retina was produced on the opposite side, which remained unnoticed for five weeks, and then caused a detachment of the retina.

ZASKIN (243, Detachment of the retina) reports a case in which a penetrating wound in the sclera was produced by an explosion. After three weeks it had healed completely with a shrunken scar. Two years later the retina became detached.

HIRSCHMANN.

WESSELY (244, Action of the pressure bandage in detachment of the retina), in the course of the treatment of a fresh case of retinal detachment, three times replaced the retina by means of a

firm pressure bandage and finally obtained a replacement which has lasted six months. He sought to determine experimentally the effect of constant pressure, but was unable to obtain a single case of detachment in an animal. By compression, the fluid of the vitreous is pressed out and the tension markedly lowered. But diminution of the volume of the vitreous is not of great importance either in the production or the replacement of the detachment. Perhaps it may be otherwise with fluid vitreous. Wessely considers it possible that vitreous fluid is absorbed as the result of the compression, but a diminution of the post-retinal fluid at the same time can have a favorable influence on the process of reattachment.

SATTLER (245, Treatment of detachment of the retina) recommends quiet rest in the dorsal position while wearing dark gray glasses in order to avoid excessive movements of the eyeball and the consequent effect on the vitreous. He does not recommend a pressure bandage. At the same time diuresis should be promoted and injections of salt solution should be made subconjunctivally. This treatment is to be continued two or three months. If the result is negative operative intervention may be employed, but with much less hope of improvement. The simple scleral puncture he considers the best operation.

After an exhaustive description of the microscopic study of his specimen and discussion of its nature, VERHOEFF [246, A rare tumor arising from the pars ciliaris retinae (terato-neuroma), of a nature hitherto unrecognized, and its relation to the so-called glioma retinae] concludes as follows: (1) From the unpigmented epithelium of the pars ciliaris retinae there may arise a tumor which exhibits the structure of an embryonic retina in various stages of development. (2) Such a tumor is malignant, but to how high a degree is uncertain. (3) It is the only retinal tumor in which neuroglia has been demonstrated, nevertheless it is not a glioma. (4) It is not to be confounded with the small benign epithelial growths sometimes described as adenomata of the ciliary body.

ALLING.

PARSONS (247, A case of glioma retinae in a shrunken globe) observed a bilateral glioma of the retina which had caused the death of an 18-months-old boy. The right eye was shrunken and contained in addition to the glioma peculiar degenerated cells in the vitreous, not characteristic of glioma. Although the shrink-

ing of the globe may have been the result of a perforation of the cornea which occurred during an attack of measles, yet there have been already published 14 cases of retinal glioma with phthisis bulbi.

ABELSDORFF.

WEHRLI (248, The relation of the retinal hemorrhages which occur during birth to the pathogenesis of glioma retinae) has drawn his conclusions from the pathological fact that the retina alone is affected, from the ophthalmoscopic picture, the age of the children affected by glioma, as well as from the facts that these tumors may occur simultaneously in both eyes, or may affect the same eye always in a certain family. The genesis of the glioma may be traced to persistent embryonal tissue which is induced to proliferate by injury, usually lacerations or hemorrhages in the retina during birth.

HIRSCH (251, Pigmentation of the retina) has studied the pathological changes in the retinal pigment in a series of cases, and divides them according to the etiology into cases due to acute degeneration of the retina, cases in which a laceration of the posterior ciliary arteries has probably taken place, cases of pigment degeneration in consequence of closure of a branch of a retinal vessel by an intraocular foreign body, and finally cases of direct injury to the pigment epithelium. In every case the cause of the imperfect nutrition and the degeneration of the pigment epithelium is a disturbance of its nutrition through the choriocapillaris. The author describes an interesting case of injury from a blow of a cow's horn, which presented the anatomical and ophthalmoscopic picture of retinitis pigmentosa. There was an acute circulatory disturbance, the same as that present in retinitis pigmentosa from sclerosis of the vessels. Although in retinitis pigmentosa the form of disturbance is not clear as yet, hereditary change of the vascular walls is at any rate necessary, not only in the choriocapillaris, but also in the retinal arteries, changes which are parallel to each other. The variations from this principal form are known as anomalies. He also reports three cases of injuries from foreign bodies in which atrophy of the retina followed by migration of pigment was observed, and finally three cases of direct destruction of the pigment epithelium. The retinal atrophy caused by direct injury is never very marked. A fissure of the vitreous lamella may co-exist with a laceration of the layer of pigment epithelium, and then causes the picture of

a rupture of the choroid through the hyaloid membrane becoming visible, not, as is usually assumed, through the sclera coming into view. This article should be read in the original.

XX.—OPTIC NERVE.

252. RABITSCH, F. Colloid bodies in the optic nerve head. *Klin. Monatsbl. f. Augenheilk.*, xliii., 1, p. 72.

253. BEARD, C. H. Temporal cleft of the nerve head. *Four. Amer. Med. Assn.*, Jan. 14, 1905.

254. WALTER, N. SHARP. A case of probable rupture of the optic nerve. *ARCH. OF OPHTH.*, xxxiv., 2, p. 131.

255. PAUL, L. A case of complete separation of the retina from the optic nerve after injury to the globe. *Kl. Monatsbl. f. Aug.*, xliii., p. 185.

256. DE SCHWEINITZ, G. E., and CARPENTER, J. T. The ocular symptoms of lesion of the optic chiasm with the report of three cases of bi-temporal hemianopsia. *Four. Amer. Med. Assn.*, Jan. 14, 1905.

257. POULARD, A. Some clinical observations of hemianopsia. *Arch. d'ophtal.*, xxv., p. 18.

258. VAN DUYSSE. Incomplete bilateral hemianopsia with preservation of the macular field, following a shot-wound in the temporal region. *Arch. d'opht.*, xxv., p. 4.

259. VEASEY, C. A. Observation of a case of bitemporal hemianopsia with some unusual changes in the visual field. *Trans. Amer. Ophth. Soc.*, 1904.

260. HEINE. Central scotoma in congenital amblyopia. *Klin. Monatsbl. f. Augenheilk.*, xliii., 1, p. 10.

261. TSCHISTJAKOW, P. J. Primary tumor of the optic nerve. *Westn. Ophth.*, 1905, vi.

262. VALUDE, E. Note on the action of antipyrin in optic atrophy. *Annales d'oculistique*, cxxxiii., p. 195.

263. MAYON, J. Intradural tumor of the optic nerve. Neuro-fibromatosis. *Royal London Hospital Reports*, xvi., 2, p. 155. (Description of a typical case in a girl five years old. Removal with preservation of the eyeball.)

RABITSCH (252, Colloid bodies in the optic nerve head) observed an excessive development of colloid bodies in the optic nerve head which had materially interfered with the vision and the visual field. The published cases of colloid formations he divides into those due to inflammation and those of purely spontaneous origin. In the latter cases it must be supposed that the colloid formations act as foreign bodies and induce a chronic inflammation. Rabitsch's own case belonged to this class.

BEARD (253, Temporal cleft of the nerve head) describes a condition of the nerve head characterized by a white, slightly depressed triangular sector on the temporal side. The retinal vessels emanate at the side. The nerve fibres are diminished in

number over this area. Associated with this there are anomalies of the retinal vessels and scanty choroidal pigment. Errors of refraction are not usually present in marked degree.

ALLING.

PAUL (255, A case of complete separation of the retina from the optic nerve after injury to the globe) adds a tenth case to the nine already reported of separation of the retina from the optic nerve. It is the only one in which the separation was complete. The eye was driven directly back upon the optic nerve by a blow. As hemorrhages into the vitreous did not appear immediately, the ophthalmoscopic pictures could be observed for some days. The laceration of the vessels produced a picture similar to that of embolism of the central artery. A blood clot occupied the place of the papilla on the gray background of the detached retina. The empty veins were refilled with blood after the lapse of a few days. Unfortunately an anatomical examination of the case was impossible.

POULARD (257, Some clinical observations of hemianopsia) reports two clinical cases of hemianopsia. In the first case there was hemianopic color-blindness with coincident reduction of the sensibility of the retina for white. Poulard claims that this case can be explained without assumption of a nervous centre for the color-sense. In the second case there was first bilateral amaurosis, then left-sided hemianopsia, followed by a right-sided hemianopsia, which produced at first bilateral blindness, but after some time vision partially returned in the right lower quadrants of the visual field. Poulard believes that two distinct lesions affected the optic radiations or the cortical visual centres on the two sides at different times.

BERGER.

VAN DUYSE (258, Incomplete bilateral hemianopsia with preservation of the macular field, following a shot-wound in the temporal region) describes a case of incomplete hemianopsia affecting chiefly the upper left quadrants of the visual field, which followed a shot-wound of the right temple. The regions of both maculae were preserved. He thinks there was a lesion of the ventral fibres of Gratiolet's optic radiation on the right side. The preservation of the macular field he explains by means of Flechsig's theory that the macula fibres occupy the lowest part of the optic radiations, which in this case was uninjured.

BERGER.

VEASEY (259, Observation of a case of bitemporal hemianopsia

with some unusual changes in the visual field) believes that his patient had a vascular tumor of some sort in front of the chiasm, which would account for the frequent variations which take place in the field. A skiagraph showed a faint shadow in the place indicated.

ALLING.

HEINE (260, Central scotoma in congenital amblyopia) has investigated 100 cases of congenital amblyopia for central scotoma and found it present in 90%, its extent corresponding to the visual acuteness. It may be round or oval, absolute or relative, and is often monocular. Hess's groups of dots were not usually useful in the demonstration. There seems to be a difference between acquired and congenital defects. Concentric contraction was rarely present. The scotoma is either functional and acquired in early childhood, or caused anatomically and congenital. A congenital defect in the region of a macula plays an important part in the etiology of strabismus, but it is not the only cause, as is shown by the fact that not all eyes with congenital amblyopia squint.

TSCHISTJAKOW'S (261, Primary tumor of the optic nerve) patient, twenty years old, had exophthalmos and divergence of the left eye, with its motility limited inward and upward. $V = 0$. Enucleation after Kroenlein's operation. The tumor involved the entire orbital part of the optic nerve and was enveloped by the optic-nerve sheath. The microscope showed it to be a glioma with myxomatous foci.

HIRSCHMANN.

VALUDE (262, Note on the action of antipyrin in optic atrophy), who in 1893 recommended the use of antipyrin in optic atrophy, has finally concluded that it is useful only in descending atrophy in consequence of infectious encephalitic disease. He injects in the dorso-lumbar region every second day 2cm of a solution of antipyrin 25, cocaine mur. 0.25, distilled water 50. Twenty-five injections are necessary, but it may be advantageous to repeat this series of injections.

BERGER.

XXI.—INJURIES, FOREIGN BODIES, PARASITES.

264. HANSELL, H. F. Traumatic emphysema of the orbit and lids. *Trans. Amer. Ophthal. Soc.*, 1904.

265. FEILKE, O. Double perforation of an eyeball (anterior and posterior wall) by a hook needle. Recovery with perfect vision. *Arch. f. Augenheilk.*, lii., p. 157.

266. PEIPER, O. Shot-wounds of the eye. *Inaug. Diss.*, Berlin, 1905.

267. HIRSCHBERG, J. Fragment of iron in the lens. Blindness from increase of tension. *Contribl. f. Augenheilk.*, xxix., p. 41.

268. BREKLE, R. Successful extraction of pieces of copper from the eye. *Inaug. Diss.*, Tübingen, 1904.

269. DE SCHWEINITZ, G. E. Concerning certain non-traumatic perforations of the macula lutea. *Trans. Amer. Ophth. Soc.*, 1904.

270. CASSIMATIS, C. Concerning foreign bodies in the eye. *Archives d'ophtalmol.*, xxv., p. 162.

271. CHAVEZ, L. Intraocular cysticerci. Extraction of a subretinal cysticercus. *Recueil d'ophtalmologie*, xxvii., p. 1.

272. SNELL, SIMEON. The electro-magnet in ophthalmic surgery. *Ophthalmoscope*, Feb., 1905.

273. COLLINS, Sir W. J. Traumatic palsy of levator palpebræ, superior rectus, and sphincter pupillæ, with marked monocular amblyopia, persisting for several days and terminating in recovery. *Ophthalmoscope*, March, 1905.

FEILKE [265, Double perforation of an eyeball (anterior and posterior wall) by a hook needle. Recovery with perfect vision] had a case of double perforation of the eyeball by a hooked needle. He managed to free the barbed point and to withdraw it through the wound. The injured portion of the retina was not important to the function of the eye and therefore perfect vision was secured.

PEIPER (266, Shot-wounds of the eye) has presented in statistical form the shot-wounds which have been treated in the University eye clinic at Berlin during the years 1897-1902.

HIRSCHBERG (267, Fragment of iron in the lens. Blindness from increase of tension) saw a case of injury to the eye two years after its occurrence. A piece of iron was encapsulated in the anterior part of the lens and had induced glaucoma. Enucleation was performed.

BREKLE (268, Successful extraction of pieces of copper from the eye) reports 7 successful cases of extraction of pieces of copper from the eye and claims that the prognosis is not as bad as is usually supposed. At any rate these cases show that an attempt to extract is indicated even when suppuration has commenced. In such cases the use of the ophthalmoscope as a guide to the seizing instrument is of no avail.

The so-called "hole in the macula," a number of examples of which have been recorded, is usually of traumatic origin. DE SCHWEINITZ (269, Concerning certain non-traumatic perforations of the macula lutea) presents two cases of exactly similar

character which were not due to traumatism. One case was that of chronic heart disease and arterio-sclerosis. In the macular region was a sharply defined reddish area slightly sunken below the level of the retina (+ 0.5 D.). The other lesion was of the same sort, occurring in an eye which had suffered from iritis. He thinks that the condition may be due to a form of atrophy confined to the macula.

ALLING.

SNELL (272, The electro-magnet in ophthalmic surgery) was the pioneer in the use of the electro-magnet, and he commenced his investigations 27 years ago, and the first case on which it was used was in 1880. His experience now amounts to fully 300 cases. As is well known, Snell's magnet is one of the varieties of hand magnets, and although he has nothing whatever to say against the giant magnets, yet his paper has for its object the setting forth the advantages of the hand magnet. The ease with which it can be handled, its portability, and its cheapness are very strong points in its favor when compared with the giant instrument of Haab.

MARSHALL.

COLLINS'S (273, Traumatic palsy of levator palpebræ, superior rectus, and sphincter pupillæ, with marked monocular amblyopia, persisting for several days and terminating in recovery) patient was a boy, aged fourteen, who was admitted suffering from ptosis of the right eyelid and marked dilatation of the pupil. He stated that five days previously he had been thrust in the right eye with a pitchfork. No evidence of a penetrating wound could be detected, but there was a minute wound of the conjunctiva near the inner canthus. In addition to complete ptosis there was no upward movement of the eyeball, though the other movements were present, the pupil was widely dilated and inactive, and the vision was reduced to bare light perception. There was no sensory disturbance. Ophthalmoscopically the eye was normal. After a few weeks all the symptoms passed off, and in discussing the possible cause for all this disturbance, Sir William Collins considers that the trauma occasioned some "molecular" changes in the optic nerve, the ciliary nerves or muscle, and the levator or rectus superior muscle or their respective nerve supplies, which abolished temporarily their respective functions, though only for some two or three weeks.

MARSHALL.

XXII.—OCULAR DISTURBANCES IN GENERAL DISEASES.

274. BORLAND, H. B. A case of exophthalmos in the newly born. *Lancet*, Nov. 12, 1904.

275. CRAWFORD, L. A case of exophthalmos in the newly born. *Lancet*, Nov. 19, 1904.
276. FATRY. Contribution to the study of ocular lesions in malformations of the skull, particularly in oxycephaly. *Thesis*, Paris, 1905.
277. UHTHOFF, W. Concerning high degrees of exophthalmos in deformities of the skull. *Klin. Monatsbl. f. Augenheilk.*, xliii., 1, p. 1.
278. NICOLAS and CADE. Neoplasm of the stomach; endocarditis; cerebral embolism; conjugate deviation of the head and of the eyes, with hemianopsia from softening. *Soc. méd. de l'hôp. de Lyon*, Nov. 15, 1904.
279. BABINSKI, J., and Mlle. TONFESCO, S. Cyanosis of the retina in a case of stenosis of the pulmonary artery without general cyanosis. *Annales d'oculistique*, cxxxiii., p. 115.
280. STRZEMINSKI. Rare complication of zoster ophthalmicus. *Recueil d'ophtalmologie*, xxvii., p. 16.
281. SIMON, R. A case of detachment of the choroid and retina with cyclic albuminuria. *Klin. Monatsbl. f. Augenheilk.*, xliii., 1, p. 221.
282. CABANNES. Optic neuritis and atrophy in facial erysipelas. *Congrès des méd. alienistes et neurologistes*, Pau, 1904.
283. BRICHE, RAVIART, and CAUDRON. Contribution to the study of the state of the fundus of the eye in general paralysis. *Congrès des méd. alienistes*, 1904.
284. KOLBE. Surgery of tumors of the prefrontal lobe of the brain; their localization by ophthalmoscopic examination. *Thesis*, Paris, 1905.
285. WOOD, C. A. Glioma of the pons with the eye symptoms, and report of the autopsy in a child seven years old. *Ophth. Rec.*, Dec., 1904.
286. DE SCHWEINITZ, G. E. The ocular symptoms of cerebellar tumor. *N. Y. Med. Jour.*, Feb. 11, 1905.
287. HOLDEN, W. A. A case of mind-blindness unique in that the entire mesial surface of both occipital lobes and both optic radiations were preserved. *Trans. Amer. Ophth. Soc.*, 1904.
288. KALT. Hysterical amblyopia following enucleation of an injured eye. *Soc. d'ophtal. de Paris*, Dec. 6, 1904.
289. PFINGST, A. S. A case of bilateral hysterical amaurosis. *Oph. Record*, Feb., 1905.
290. REDSLOB, D. Bitemporal hemianopsia and diabetes insipidus. *Klin. Monatsbl. f. Augenheilk.*, xliii., 1, p. 226.
291. HOUDART. Septic ophthalmia in a patient suffering from diarrhoea of hot countries. *Recueil d'ophtalmologie*, xxvii., p. 65.
292. PERNOT. Oculo-pupillary troubles in chronic pulmonary tuberculosis and in pneumonia at the apex. *Thesis*, Paris, 1905.
293. GERARD, GEORGES. Two cases of optic atrophy following ozæna. *Echo médical du Nord*, Oct. 2, 1904.
294. CHAUFFARD, A., and LEDERICH, L. Inequality of the pupils in pleurisy with effusion. *Arch. gén. de méd.*, March 7, 1905.

In BORLAND'S (274, A case of exophthalmos in the newly born) case the child was born of a healthy mother, quite naturally and without the aid of forceps. Some hours after birth an effusion of blood was noticed under the conjunctiva of the right eye, which,

on the next day, was found to project downwards and forwards. There was paralysis of the superior rectus, which passed off, and the child completely recovered. MARSHALL.

CRAWFORD (275, A case of exophthalmos in the newly born) met with marked exophthalmos of one eye in an infant following natural labor. The condition completely cleared up with apparently no affection of the sight. MARSHALL.

UHTHOFF (277, Concerning high degrees of exophthalmos in deformities of the skull) has seen three cases of high degrees of exophthalmos with oxycephalia, hydrocephalus externus, and hydrocephalus internus. In all three cases the principal cause of the displacement of the globe was the change in the form of the orbit produced by the dislocation of the bones. Venous stasis from increased intracranial pressure with compression of the cerebral sinuses can enter little into the etiology of the great exophthalmos in these cases.

NICOLAS and CADE (278, Neoplasm of the stomach; endocarditis; cerebral embolism; conjugate deviation of the head and of the eyes, with hemianopsia from softening) report a case of cancer of the stomach and of endocarditis, in which a centre of softening was produced in the left calcarine fissure by embolism, which induced symptoms of hemianopsia. A simultaneously occurring conjugate deviation of the head and the eyes may be explained in this case as the result of the hemianopsia, as the head and eyes were turned toward the direction of the preserved portions of the field. In fact the deviation steadily increased during the coma which preceded death, and at the autopsy no changes could be found aside from the focus of softening in the calcarine fissure. BERGER.

BABINSKI and Mlle. TONFESCO (279, Cyanosis of the retina in a case of stenosis of the pulmonary artery without general cyanosis) report a case of stenosis of the pulmonary artery with no general symptoms of cyanosis in which there was evident cyanosis of the retina. BERGER.

SIMON (281, A case of detachment of the choroid and retina with cyclic albuminuria) observed a detachment of the choroid and retina in a young girl with cyclic albuminuria. The detachment of the choroid was determined from the retained functional capacity of the rods of the detached retina, because the rods receive their visual purple from the pigment epithelium which

remains attached to the choroid. An exact demonstration was possible in this case because only a small portion of the retina was detached while the rest retained good vision.

BRICHE, RAVIART, and CAUDRON (283, Contribution to the study of the state of the fundus of the eye in general paralysis) investigated the fundus of the eyes of twenty-three women suffering from progressive paralysis and found changes in eighteen. In three the margins of the papillæ were wasted away, in eleven the papillæ were pale, in two they were white with obscure margins, and in two the optic nerves were atrophic. Most of the patients were in the advancing stage of the paralysis.

BERGER.

WOOD's (285, Glioma of the pons with the eye symptoms and report of the autopsy in a child seven years old) patient, a child seven years old, had complained of headache, vertigo, and nausea. There were mental dulness, paresis of both external recti, and choked disks. Autopsy revealed nodular irregularities on the lower surface of the pons. On section the right half of the pons, and to some extent the left, was found to be infiltrated with neoplastic tissue, which proved to be glioma.

ALLING.

KALT (288, Hysterical amblyopia following enucleation of an injured eye) observed a traumatic iridocyclitis, which rendered enucleation necessary, in a powerful man forty-nine years old. Fourteen days after the enucleation hysterical amblyopia appeared. The vision fell to $\frac{1}{16}$, the fields for white and colors were concentrically contracted, and there were disturbances of sensation on the face, the back, and the hands. Kalt conceives the case to be one of traumatic hysteria, but it is noteworthy that the hysterical amblyopia appeared fourteen days after the enucleation had taken place.

BERGER.

Bilateral hysterical blindness is uncommon. The patient of PFINGST (289, A case of bilateral hysterical amaurosis) suddenly developed blindness in both eyes, associated with hysterical symptoms. No pathologic lesions and a rapid recovery confirmed the diagnosis.

ALLING.

REDSLOB (290, Bitemporal hemianopsia and diabetes insipidus) saw a case of severe injury to the head of a child who had a complete defect of the temporal portion of the visual field. He considered the cause to be a laceration of the decussating fibres of the chiasm in the median line.

GERARD (293, Two cases of optic atrophy following ozæna) reports two cases of bilateral optic atrophy, the consequence of ozæna. His explanation is that the disease was transmitted through the accessory sinuses of the nose to the base of the brain by means of osteitis or inflammation of the veins of the diploë.

BERGER.

CHAUFFARD and LEDERICH (294, Inequality of the pupils in pleurisy with effusion) found in forty-seven per cent. of the cases of pleurisy with effusion an inequality of the pupils. The pupil on the side with the exudate was dilated, but this was evident only in moderate illumination. They suppose that this is a symptom of inhibition of the fibres which conduct the light reflex.

BERGER.

BOOK REVIEWS.

I. **Atlas and Epitome of Operative Ophthalmology**, by Prof. O. HAAB, of Zurich. Revised translation, with notes and additions, edited by G. E. DE SCHWEINITZ, A.M., M.D., Prof. of Ophthalmology, University of Pennsylvania, etc. With 30 colored lithographic plates and 154 text-cuts. W. B. Saunders & Co., 1905.

Prof. Haab says: "As a rule, mere verbal description does not suffice to give a clear idea of operative procedures—pictorial illustration is indispensable." The illustrations in this book are reproductions of the photographs made under Haab's direction. The instruments here represented were taken from Weiss & Son, London; H. Windler, Berlin; H. Wulffing-Lüer, Paris; G. Tiemann & Co., New York; and Chambers, Inskeep, & Co., of Chicago.

Haab and his eminent teacher, Horner, lay great stress upon the fact that the patient, after capital operations, must, as much as it is possible, be kept strictly quiet. The reviewer, after cataract extraction and some other important operations, lets the patients be watched, during the first night, by a trusty nurse, after they have taken a morphine pill before and after the operation.

The arrangements of the operating and sleeping rooms are carefully described, with many good hints by the editor which, throughout the book, are useful additions.

Ether is considered far safer than chloroform (Editor), which is heartily endorsed by the reviewer, who, during nearly fifty years of practical eye and ear surgery, has never had a death. He gives the anæsthetic himself and has pulse and respiration carefully watched so that the resuscitation exercises can immediately begin. He does it by the old Marshall Hall's method—that is, the upper part of the body is turned on the front and then back, which is done as slowly as regular breathing. It imitates the rhythm of the natural breathing, with the addition that the body is turned from back to front, and *vice versa*. The method has the great advan-

tage of being always ready. The operator sees the danger at once, and he, the anæsthetizer, is also the resuscitator. Chloroform is an agreeable but treacherous anæsthetic. The late Prof. A. v. Gräfe, who was a nervous man, was so anxious in chloroformization that he never had a full anæsthesia.

Local anæsthesia, with infiltration of Schleich's method, is convenient for many cases.

E. J. Barker gives a solution for infiltration :

R	Pure chloride of sodium	0.8	gram.
	Beta cocain	0.2	"
	Adrenalin chlorid	0.001	"
	Distilled water	100.	"

The very important chapter, **Sterilization, Antisepsis, and Asepsis**, presents minute advice at considerable length, as it deserves. Under the head "**Disinfection**," Haab describes also his method of **introducing little pencils of iodoform** into the anterior chamber. This has not found sufficient approval to endorse it, as far as the reviewer can judge. Then follow the necessary instruments and apparatus.

Operations on the Eye. Operations on the Globe. Operations for Cataract. This chapter (greatest question in ophthalmic surgery) is presented with particular care. The senile cataract is a normal process, the involution of the lens in old age. If the reviewer considers his own material as to the development and percentage of cataract, he should roughly say that at the *sixth decade* 33% of the people show beginning of cataract, mostly at the periphery and covered by the iris, so that the patient is not aware of it, and his sight is not materially impaired. In a smaller percentage the star-substance shows first. It serves no purpose if the oculist tells the patient that he has a beginning cataract.

In the *seventh decade* 66% have cataract, and sight is so that in moderate light they are not much annoyed. These persons are mostly capable of performing their work without much trouble.

As to the *eighth decade*, I have rarely examined an octogenarian that had not more or less cataract.¹

¹ The reviewer is not in the habit of telling the people that they have a cataract, unless they feel difficulties. In a conversation with Prof. Helmholtz and a young oculist, like myself, he said to me: "If the patient from whom you have concealed his cataract, let another oculist examine him and tell him the truth, would that not damage your reputation?" I replied: "A reputation which is damaged for this concealment is not worth the having." Another test case of the same kind was the following: A wealthy man of sixty-five consulted me.

Preliminary Conditions of Operating on the Different Kinds of Cataract: Juvenile and senile, maturity of cataract, ripening of immature cataract, pricking or incising the capsule, massage of the anterior capsule (Förster), then the different kinds of cataract : *Cataracta nigra*, Morgagnian cataract, sclerosed nucleus (with milky cortex, and others with transparent cortex), the ripening through irrigating, of McKeon, Lippincott, and others. The author is no enthusiast of the ripening scheme. Preliminary iridectomy is unquestionably most desirable. At page 102 the description of the different cataracts begins. The tests for ripeness, and abnormities in the eye and constitution (complications).

The Operation for the Removal of Total Juvenile Cataract.

It may be operated on when the child is a year old ; do not let it be over two years. The method of opening the anterior capsule with a Bowman's stop-needle is, in the reviewer's mind, not the best procedure. This needle ought not to be spoken of except historically. It is sharp only on its peripheric half. The reviewer saw it used in the old Moorfields hospital by the best operators, Bowman and Geo. Critchett, forty-five years ago, and the little needle became very popular all over Europe. The abrupt thickening of the shaft prevents the needle from penetrating into the depth. At that time they used no focal light in operating. The window in the small operating room gave a doubtful light, so that the instrument was moved in all directions; the "stop-needle was safe." The reviewer operates those cataracts with a well proportioned knife-needle. The introduction is about 3 mm from the corneal limbus on the temporal side, which is pushed straight forward nasally, then the cutting edge is perpendicular to the anterior surface of the lens, then the point is introduced into the anterior cortex at the nasal edge of

I saw a beginning cataract, which I entered into my case-book, but told him his eyes were not so sharp as in youth, but there was nothing unusual in them. I gave him the proper glasses, and the man always, when he saw me, thanked me for the glasses. Five years later he came to me again, quite downcast, telling me that he had consulted Dr. N. and he had told him that he had a cataract in both eyes. I asked him to come to my office, I would examine his eyes and consult my case-book. He came and read: "Cataract on both sides." I told him I had concealed the fact from him, because he would have been depressed, and I said to him, if he had come to me now, I would not have told it to him, because he could live five years longer without his cataracts annoying him. He was consoled and died at eighty. His cataract had darkened so little that he did not speak of an operation.

the dilated pupil, then it is drawn horizontally, so as to split the capsule as far as the temporal edge of the pupil. Now the knife-needle is rotated 90° , with the back up or downward, to split the capsule from above down to the horizontal opening; after this the needle is rotated 180° until the point is arrived at the lower part of the pupil; the point penetrates the lower capsule and splits it from the edge of the pupil to the horizontal incision. In this way a large central opening in the capsule is obtained, without interference with the capsule. It is exactly the same procedure as with the capsule of the secondary cataract. The reaction is trifling in the great majority of cases. When the cataract has been absorbed, the same procedure has to be repeated for the after-cataract, *i.e.* the two capsules, which are mostly somewhat thickened by small deposits and wrinkling. This operation is delicate, but safe and efficient.

Operations for Soft Cataract in Adults. If they are unripe, let them ripen, and if it remain too long, ripen it with a needle. The operation then following is the "simple linear extraction."

Operation for Traumatic Cataract varies according to the condition.

Lamellar Cataracts are so different that a general rule can not be given. From the "arcus senilis lentis" (which is a variety of lamellar cataract) "until the lamellar cataracta duplex or even triplex," the interference of sight is so little that many of them require no operation; if, however, the sight is insufficient, **iridectomy** or **suppression (removal)** of the cataract has to be decided on, and, therefore, the acuteness of vision determines the method.

Operation for Senile Cataract. Historical remarks, and description of the preparation of the patients; and the description of the instruments are well considered by the author and the editor. Positions of the hands and the patients are given in life-size chromos; the one opposite p. 140, where the iris is stroked out of the angle of the cornea, in combined extraction, is instructive and very well presented. To do this is an important precaution in extraction with iridectomy. Among the varieties of method, the removal of the centre of the anterior capsule with a capsule-forceps receives more patronage, particularly in combined extraction. The absence of the anterior capsule in the area of the pupil is very favorable. In the last years the removal

of the lens with the capsule is pressed on the European and American eye-surgeon, by Major Wm. Smith, of Jullundur, Punjab, India. His publications contain very strong arguments. His paper on the subject (see p. 137 of this issue of the ARCHIVES OF OPHTHALMOLOGY) cannot fail to draw strongly the attention to this important operation. Major Smith describes his method and backs it with more numerous and far more successful operations than any other eye-surgeon has made public. The reviewer* is more and more prepared to give this method a trial. In former times he has operated a number according to this method, which in modern times was patronized by A. and H. Pagenstecher at Wiesbaden, but he has not found that it was safe to adopt it as a general operation, but, as the Pagenstechers did, restricted it to hypermature cataracts. Lately, however, he has extracted a cataract, in a man of about thirty-five, in the capsule, through a downward section, and without iridectomy and without prolapse of vitreous. It was a perfect success, healing with round, clear pupil; S. perfect; healing process free from reaction. Of all the shortcomings in the technique of extraction, it is seen when the lens presses into the opening without getting an exit. Force bruises the edges of the wound; the cortical remnants, which have remained in the wound as a foreign body, inflame the cornea in intensity and kind—moderate congestion, fibrinous swelling, or purulent infiltration; the bruised edges give a good pabulum to the pus microbes. The remedy is not to squeeze the lens through, but dilate the section on one or both corners. H. Pagenstecher recommends von Hoffmann's ichthyol dressing. Pure ichthyol is spread on a piece of gauze, saturated with liquid paraffin, and laid on the eye. Both eyes are covered with cotton and protected by a shield. From the second to the fourth day the eye is covered in that way during the night; in the daytime the covering is removed.

It is not advisable to discharge a patient before sixteen days after the extraction.

Detachment of the choroid by serous exudation is not rare, and disappears spontaneously.

Operation for Secondary Cataract. This chapter is well presented, but as the operation has been so often described in the last fifteen years, reviewing it may be omitted. To appreciate these delicate operations, study of the original article and clinical observations by expert operators is needful. Many

operators think that these secondary operations are more risky than the primary. This is entirely against my experience, and I have made several thousand of these operations. A loss by this operation is the rarest accident, and in computing the gain in visual acuteness, it was more than the gain through the extraction by the same number of primary operations.

Senile Cataract by Couching and Depression. These operations have been dead for many years; let us not revive them!

The Operative Treatment of Dislocations of the Lens. If they are still held by parts of their suspensory ligament lying in the vitreous and produce no annoyance, leave them alone; if annoying the eyeball, we may be obliged to try to get them out. Sometimes the reviewer, by alternate pressure on the sclerotic, has got out lenses floating in the vitreous, through a large corneal section, without any unpleasant reaction. If they irritate the eye; iridocyclitis; with loss of sight, the best is to enucleate the globe.

Operation for Secondary Cataract with Knapp's Knife-Needle Introduced through the Sclera (from behind). Da Gama Pinto and other pupils of the older Vienna School, and several operators who have practised this rather inconvenient measure, which has no advantage over the introduction through the cornea, and lacks preciseness, have all abandoned it; the last to embrace and the quickest to abandon it was DE LAPERSONNE, the eminent Professor of Ophthalmology in the Medical Faculty of the University of Paris.

Removal of the Lens in High Myopia. It was pointed out by Beer, in 1817, and by Mauthner in 1876, as well as by others, that a very high grade of myopia can be improved by removing the lens. The operation for myopia was first performed by ADOLPH WEBER in 1858, but was not adopted by the operators of his time. FUKALA returned to the method and wrote about it in 1889. He was followed soon by VACHER in France. The operation then was taken up with—perhaps too great—enthusiasm. Grave dangers are inherent in this operation. To meddle with the vitreous in a highly myopic eye predisposes to hemorrhage, detachment of the retina, recently or even years later. Glaucoma has often occurred by slight inaccuracies of technique.

The man that operates on a myopia less than 15 D. brings the method into ill-repute. The patient exchanges his strong concave

glass for a convex glass of equal strength, and loses its good near vision without spectacles of which he was so proud. After the operation he has to wear a heavy cataract lens of 8 D. or more for near work. The reviewer, in harmony with the views of the author, has copied the previous pages almost word for word.

In children discission and absorption alone should be done. The final discission, that of the posterior capsule, should be omitted, or at least not be done sooner than six months after the preceding operation, and after the eye has had complete rest and is free from irritation. Scrupulous care, even for the first discission of the anterior capsule, is indispensable to avoid laceration of the zonule. Such eyes have naturally weakened zonules, easily injured by the first opening of the capsule. The cataract swells, the tension is increased, a second puncture is required, vitreous escapes again, with but a little lens substance, and the condition ends in glaucoma, with which the surgeon will have to contend for months without satisfaction. It is advisable to operate on one eye alone.

Iridectomy. This chapter is very practical. The elementary part, and the description of the **optical** and **curative** iridectomy are well presented. The first part is elementary, for the tyro ; the more difficult part, that of acute or chronic disease, enters into a good deal of important surgical detail and the well-digested practical experience of the ophthalmological expert. The first part need not here be mentioned ; the second part suggests and recommends a number of technicalities worthy of repeating to the tried eye-surgeon. The technique of the glaucoma, iridectomy, and also its indications and the treatment of the prodromic stage, are clearly brought forward. The author says : Preliminary local anæsthesia with cocaine and adrenalin is most important. The editor says—rightly in the reviewer's opinion : general anæsthesia is preferable, when not contra-indicated by physical conditions. It is also necessary to instil eserine into the healthy eye, to prevent the outbreak of glaucoma in it. The editor says eserine should be used also on the unoperated eye during the convalescence from the iridectomy. Both eyes should be bandaged until the iridectomy wound has healed and the anterior chamber is restored. The operation is delicate, the technique and vigilance of the operator must be perfect and uninterrupted. The author favors the keratome more than the small knife, its sections close more readily and more even than

those of the Graefe knife. The reviewer and some operators in this country put a drop of atropine on the eye immediately after the iridectomy, which can be unhesitatingly done, and it is indicated when some blood is in the anterior chamber; as long as the wound is not yet closed the atropine does not counteract the recovery. It prevents the fine adhesions which occur readily by the agglutination of the iris to the lens.

The introduction of the keratome is important. The instrument should not be introduced too deep. It should be entered 2-3mm behind the limbus, and advanced so that the point and blade almost skim the iris, guarding most carefully against wounding the iris and still more the lens capsule. In acute glaucomas, especially when the pupil is dilated through atropine by the family physician, which still occurs on both shores of the Atlantic, when we are on our guard not to injure iris or lens, we easily push the keratome forward between the lamellæ of the cornea. The adept soon finds this out and steers his ship so that he avoids both Scylla and Charybdis. So long as the blade of the keratome is within the corneal tissue it is lack-lustre; when it is slightly drawn back, pushed forward and a trifle lower, the surgeon sees the bright lustre of the point and pushes the point farther on until it is before the centre of the anterior capsule. To avoid that aberration, the point of the keratome has to be constantly watched, avoiding injury to the iris and lens in advancing, and on withdrawing the knife to avoid grating Descemet's membrane.

When there is **no space between iris and cornea** the method of GAYET and SCHÖLER is available. A small Graefe knife, or, perhaps better, a very sharp scalpel, or a scarifier, is passed, perpendicular to the meridian, repeatedly over the cornea until a drop of water shows that the anterior chamber has been penetrated. The small opening is dilated with a blunt-pointed, delicate, slightly curved (as a canaliculus) knife, or with scissors, the end pieces narrow, but with very well cutting edges—recommendable are the Stevens squint-scissors, made by George Tiemann & Co., at New York. The remainder of the operation presents nothing particular.¹

The late Dr. de Wecker recommended, under the name of sclerotomy, a simple incision at the corneal border, without iridectomy. This expectation as a curative agent of glaucoma has

¹ The reviewer saw such an operation by Dr. MARC DUFOUR, at Lausanne, which was without accident, and successful.

not been verified in recent cases. It cannot be denied, however, that sclerotomy acts well in the later stages of glaucoma and in children, and it is possible, therefore, that part of the effect of an iridectomy is to be attributed to the increased seepage (filtration).

Sclerotomy. Anterior sclerotomy is not so effective as iridectomy, but it can be repeated as often as desirable. In infantile glaucoma, in advanced and hemorrhagic glaucoma, I believe, from my experience, that it is preferable to iridectomy, to which it is often a useful accessory or complementary operation, for in many cases of glaucoma which present themselves late for treatment iridectomy fails to effect a permanent cure, and sooner or later a secondary operation becomes necessary. In iridocyclitis with deposits and increased tension, sclerotomy is the proper operation, and iridectomy would be altogether out of place. In keratoconus, repeated sclerotomy is indicated—to arrest the progress of the disease.

Sclerotomy may be performed either with the keratome or with the cataract knife; the latter is not prone to produce iris prolapse. After the entrance and exit wounds have been enlarged to about 3mm, a broad bridge of sclera is allowed to stand. The incision must not be so large as to produce a prolapse of the iris, causing a distortion of the pupil. To make the incision correct, it is necessary to apply the fixing-forceps midway between the points of entrance and exit. Illustrated by Plate 7, a chromo.

A second sclerotomy after the first enhances the effect. Preparatory treatment with myotics is also necessary for sclerotomy, to guard against prolapse of the iris into the wound.

Posterior Sclerotomy. A short incision is made in the sclera with a Gräfe-knife in the equatorial region and at the same time incising the vitreous to a considerable depth. The patient looks toward the nose, the conjunctiva is seized with the fixing forceps near the horizontal meridian and drawn slightly down. The Gräfe-knife, its back turned toward the cornea, punctures the sclera 5mm behind the cornea, slightly below the horizontal meridian, about 10mm toward the centre. On retiring, the knife is slightly turned on its axis, to make the wound gape and let some fluid out.

In cases of retention of the lens in the anterior chamber more than two weeks, Adolf Weber makes a posterior sclerotomy, and lets out vitreous through the scleral wound, gaping by $\frac{1}{4}$ turning of the knife, by pressing on the eyeball from above and in front

down and back, to induce the lens to retreat into its normal place. This is to prevent the development of malignant glaucoma.

All these operations, as the reader will see, are very well and clearly described, but there is one capital omission: the value of the operations—*i.e.*, statistics, with success and failure, for many of these operations appear quite unreliable. The reviewer should have liked to learn, for instance, the benefit the patients received from the posterior sclerotomy and the like.

The second half of the book comprises the operations on the **Cornea, Sclera, and Conjunctiva**. As they are not so important, we may go lightly over them.

The first chapter (IV.) treats of the **removal of foreign bodies** (1) those on the tissues; (2) the operation of puncturing the cornea, paracentesis of deep corneal ulcers; (3) the operation for pterygium; (4) covering defects with conjunctiva; (5) tattooing of cornea; (6) removal of dermoids; (7) staphyloma of cornea.

(V.) **Operations in the Anterior Chamber.** (1) Separation of ant. synechiæ; (2) of post. synechiæ.

(VI.) **Removal of Foreign Bodies from the Interior of the Eye.** (a) **Spicules of iron (magnet operation).** This important chapter is fully presented; the author's researches in this department are most ingenious and meritorious (the well-known Haab's giant-magnet).

(b) **Removal from the Interior of the Eye of Foreign Bodies not of Iron.**

Operations outside the Eye.

Ocular Muscles. Strabismus: (1) Tenotomy of Gräfe; (2) of Arlt; (3) of Snellen.

Operations on the Antagonist of the Squinting Muscle. (1) Knapp's method; (2) Weber's; (3) de Wecker's; (4) Landolt's advancement; (5) Prince's method; (6) Verhoeff's operation; (7) Worth's; (8) Wecker's; capsular advancement, Todd's, Brand's, Schweigger's, Koster's, L. Müller's, Verhoeff's lengthening a tendon. These operations are all sufficiently described to perform them.

Enucleation of the Globe is well and extensively described; then follow resection of the optic nerve, which formerly was removed as a preventive of sympathetic ophthalmia; exenteration or evisceration of the globe; artificial glass eyes; removal of

orbital tumors; Kroenlein's operation to get access to the depth of the orbit by an osteoplastic resection of the temporal wall.

Operations on the Lids and in the Conjunctival Sac. Then follows the description of the operations for ptosis, then those for entropion, further blepharoplasties, and last the operations on the lachrymal organs.

To sum up, we say that Haab's *Hand-Atlas of Operative Ophthalmology* is a work well-conceived, carefully written, faithfully and attractively edited in English. The enterprise of the publishers has received a new token of their keen and lucky sense of selection, the reward of which is self-evident.

H. K.

II.—The Ophthalmoscope and How to Use it. With seventy-three illustrations—twelve colored plates. By JAMES THORINGTON, A.M., M.D., Professor of Diseases of the Eye in Philadelphia Polyclinic and College of Graduates of Medicine. P. Blakiston's Son & Co., 1012 Walnut St., Phila., 1906. Price \$2.50.

This octavo of 298 pages is very well gotten up; paper, print, and illustrations are as good as anybody could wish. The contents deserves a fine garb.

Chapter I. begins with the choice of the ophthalmoscope. It is not genteel to introduce the invention of the ophthalmoscope with the words: "The original ophthalmoscope of Helmholtz (1851) is a crude affair and is now a museum-curiosity," as the ophthalmoscope of the present day excels the Helmholtz instrument in every particular, but for the general student the modified instrument of Loring appears to meet with most favor in America, and the Morton, an excellent instrument, is quite popular abroad. The reviewer differs from the author and considers neither of these instruments the best for the beginner: the Morton is a very good instrument, but unnecessarily complicated, and the popular Loring could also be simpler. The swinging mirror is intended to avoid astigmatic aberration. This is in all cases insignificant. Helmholtz gives in his first publication on the ophthalmoscope the following rule: The line from the right to the ophthalmoscope, and the line from the ophthalmoscope to the patient's eye, should coincide as near to each other as possible. If we follow this rule, the effect of the obliquity, even in strong glasses, is neglectable; but as I see so often in my clinic young oculists seat the patients more or less sideways and them-

selves right near the patient's eye, the light line from the burner to the ophthalmoscope will strike the correcting lens behind the sight-hole in the mirror very obliquely, much more than the small angle of the swinging mirror.

In my student days I learned, in the old Moorfields hospital, a great advantage in using the ophthalmoscope from the late surgeon and oculist, Mr. HULKE, a very clever man. He never sat in using the ophthalmoscope; he and the patient were standing before the lamp. I asked him why he did not sit. He said, "I save time." Saving time is not the only gain, but the position before the lamp fulfilled the rule of Helmholtz, that the little lens behind the hole in the mirror deviated so little from being at right-angles to the light-line that there was no astigmatic action. At the time when the swinging mirror was invented, I made experiments with a Loring ophthalmoscope and a simple spherical mirror, to see how the astigmatism differed: it was practically the same. Since that time, more than 25 years, I have been in the habit of examining my patients standing. This has saved me a great amount of valuable time. It is also more convenient. In the erect image, I am much nearer to the patient's eye, and I can stand 1'-2' before the light. I want to express my opinion that the popular, and therefore very cheap, Loring ophthalmoscope can be simplified, and I contend that the swinging mirror may be dispensed with, and, for the beginner surely, also the turning quadrant with a certain number of auxiliary lenses. I have asked many oculists whether they had used this quadrant. The answer always was negative.

Against the Morton ophthalmoscope I have nothing to say, except its complication. With the rule of Helmholtz on the arrangement above mentioned, I can say that a concave mirror and a rotating disk with 2 dozen auxiliary lenses have always been sufficient for me. The author describes the ophthalmoscope room, and the use of the mirror to discover all that can be found behind the pupil. He has constructed also an artificial eye for technical drill, and to find all that the physician must know. The use of mydriatics. He recommends a fresh 4 % solution of cocaine, which dulls the cornea and therefore also the fundus. On the next page he says: a 2 % solution of *euthalamin* may be used in preference to cocaine [in the next edition he should remind the proofreader that this solution is euphthalmine].

I find by the ophthalmologists who visit my clinic that the

indirect method is neglected in America, in favor of the direct method. That should not be; we obtain a general survey easier and better with the indirect method—inverted image. We want both. The indirect method orients us very quickly; we find what is wrong, and then we magnify it either by the direct method—erect image,—which magnifies about 16 diameters, whereas the indirect with an auxiliary glass of 2"—2.5" focus gives only 4-5 diameters. We can, however, magnify the inverted image by using weaker lenses before the eye (4" focus) and a stronger lens (4" focus) in the rotating disk. The low magnification has a great advantage in furnishing a much larger ophthalmoscopic field. For we may measure abnormalities in comparing them with an object of known dimensions of the optic disk.

· About two weeks ago I had, by the courtesy of one of my professional friends, the rare opportunity to diagnose a cysticercus—the first I had ever seen in America, *i. e.* in 38 years, among 90,465 private, and 306,133 clinical patients. With the ordinary arrangement of a +3" objective lens, a distinct and transparent cyst was seen in the macular region and encroaching over about one-third of the papilla. With +1/2" (20 D.) the cyst and the od could be seen together, very much smaller, but I had the advantage that I had a compact picture. My friend saw the same and also made the same diagnosis, though he had never seen such a parasite in the eye.

Focal or Oblique Illumination is a very important method of diagnosing ocular disease. It was also invented by Helmholtz. The rule with this is: to illuminate only the part we want to see; all that is before and behind must be kept dark, *i. e.* we must direct the point of the cone of light strictly to the point which we want to recognize. This must be learned, and the expert finds with this simple method the faintest opacities of the cornea, on the external surface, interstitial linear, patchy, disk-shaped opacities; the finest dots on the posterior surface of the cornea; the depth and the clearness of the anterior chamber; also the many diseases of the iris—the simple synechiæ, the specific gummous swelling round the minor zone of the iris, or the peripheric tuberculous nodules, also sarcomatous swelling growing from the ciliary body into the angle of the anterior chamber; further the lens and even into the vitreous chamber.

Chapter II. gives an elementary but thorough description of the essentials of ocular optics, viz., with many very good cuts: general principles of light; reflection; refraction; plain, spheric, convex, concave mirrors; prisms; the different kinds of lenses; conjugate foci; the numeration and variety of lenses; cylindric

lenses. Estimation of the refraction of an eye with the direct method, and retinoscopy; the latter is only sketched, the author having described it in two very commendable monographs: (1) Retinoscopy, (2) Refraction and How to Refract.¹

Chapter III. **Anatomy and Anomaly of the Eye: sclera, cornea, iris, ciliary body, and choroid.**—The description is elementary, very clear, pointing out what is important for science and practice. Many cuts illustrate the anomalies and diseases; the varieties in the membrana pupillaris (Wicherkiewicz); the various forms of opacity of the lens, and the subluxation of the crystalline body; lamellar cataract, lenticonus.

Chapter IV. **The Normal Eye-ground.**—The optic nerve disk (od) is illustrated by its surface above the section of the optic nerve and vicinity, the well-known picture, the description and figure from Fuchs. The first of the seven colored figures of the eye-ground, all excellently well painted by Miss Margaretha Washington, of Philadelphia, represents the healthy background.

Chapter V. describes the changes of the different coats and the fluids of the eye, and the crystalline lens. An extract is not available here. We want to point out that on page 138 there is the parallax determination of fixed opacities from the centre of the cornea to the posterior pole of the lens, $\frac{1}{2}$ -1 mm in front of the average position of the centre of the anterior surface of the cornea. The author need not have borrowed from Jennings, for it has been known for a long time, having been first described by Listing.

Chapter VI. deals with visual acuteness, visual field, and perimetry; scotomas, especially the paramount central scotoma.

Chapter VII. The retinal vessels, hemorrhages, hyperæmia, anæmia, embolism, thrombosis, and pigment changes. This is a very important subject not only for the oculist but for the general practitioner. The changes in the arteries are fundamental: to mention only one point, the symptom headache, which can be in the greatest numbers of sufferers brought home to its cause through ophthalmoscopic examination. In young people it mostly is caused by hyperopia and astigmatism; in persons over middle

¹ All America and all England should protest against this utterly wrong Philadelphia slang, however convenient it be. It is not much longer to say, "examine her refraction," instead of, "refract her." More than ten years ago, no lesser author than Weir Mitchell sent me a lady patient with a letter in which he wrote, "I glassed her also," but to no purpose.

age it is due to endarteritis, which we can diagnosticate by the thinness of the arterial current, the thickening of the vessel walls, the thin calibre of the visible current. The next sequel of the insufficient vis-a-tergo in the arteries is thickening of the venous current, and its consequences. This is the more important because the adept can recognize these conditions in the early stage, when it can be cured, or at least tolerated.

The second colored plate depicts embolism of the central artery and periarteritis.

A typical picture is Plate III., Thrombosis of the Central Vein, so-called Hemorrhagic Retinitis.

Chapter VIII. **Diseases of the Retina.**—The description gives more than the ophthalmoscopic conditions, but also the etiology, and the course of the disease; further, the prognosis and treatment. The changes in the retina are: (1) opacities, (2) œdema, (3) exudations, (4) hemorrhages, (5) pigment, (6) vascularity, (7) detachment, and (8) atrophy. Plate IV. gives a good picture of albuminuric retinitis. A still more instructive picture is on Plate V., *Albuminuric Retinitis of Pregnancy*. Such plates should be observed and deposited in one's memory centre, by words of tongue and pen and imitation with colored crayons. Another fine picture is Plate VI., *Retinitis Diabetica*. Plate VII., *Retinitis Pigmentosa*, is a well elaborated picture, though not the ordinary type. The type is choroidal: the od and the retinal vessels are normal instead of thinned. The even ring of ordinary homogeneous red is not typical, the white ring surrounded is not frequent. **Treatment.** "That for diabetes." There is none at all, unless there is a cause which can be removed.

Detachment of the Retina. Plate VIII. is not representative either, but very instructive: The white, apparently somewhat raised od; the arteries are small, the veins large; two are white streaks accompanied by (hemorrhagic) black pigment, and in the lower part under crooked vessels five white curved elevations.

Rupture of the Retina is rare, excepting in orbicularis with detachment.

Commotio Retinæ is not very rare. It is traumatic, mostly by blunt force, not rarely at the other side from where the blow was inflicted. Those with contrecoup show laceration. They are well defined, whitish, not rarely hemorrhagic, small and larger patches. In a few days, under bed-rest, the contusion has disappeared.

Glioma of the Retina (Beer's amaurotic cat's eye) is an infantile cancer, about the worst of all cancers. Glioma is the only neoplasm which occurs in the retina (Fuchs). Pseudo-glioma, purulent irido-choroiditis, metastatic from cerebro-spinal meningitis, puerperal fever, even artificial abortion. [The reviewer has had to treat a lady who, by the fourth artificial abortus, contracted a metastatic choroiditis. She lost both eyes. She was well bred, wealthy, had her mother and her husband whom she loved. It was mania. When she had both her eyes removed she became pregnant again, got a child of which she was very fond.]

FUCHS described, under the name of retinitis circinata, a picture not very rare, mostly a change into white, small patches in curved lines in the upper and lower limits of the macular region, which develop from retinal hemorrhages (thrombosis).

WARREN TAY,¹ of London, published, the first, a peculiar gray degeneration around a dark brown patch in the centre of the macula lutea of small children. Dr. B. SACHS, of New York, examined the general health of the reviewer's first case and other such children. He found that they all died early and were very weak, bodily and mentally. He published the disease under the name of **amaurotic family idiocy**, under which it is known. There are now over 150 cases of this disease on record. These children are almost all Hebrews, seven are non-Jews. See the paper by Dr. Mortimer Frank, of Chicago, published in *The Journ. Am. Med. Assoc.*, and in the *Annals of Ophthalmology*, No. 1, 1906.

Angioid streaks, dark brown, almost black lines, are like vessels, and course irregularly under the retinal vessels. They probably originate in changes of extravasations.

Chapter IX. **Diseases of the Optic Nerve.** The aspect of the optic nerve must be studied with the ophthalmoscope on the living and on good colored pictures. It should never be lost sight of that there is a considerable latitude at the normal od and the

¹ Living specimen. April 7, 1881. *Transactions of the Ophthalmological Society of the United Kingdom*, vol. i., p. 55, with a very fine colored illustration. A few years later the reviewer drew attention to this disease, by an identical colored picture of a very young child, with its history, before the German Ophthalmological Society at Heidelberg. Nobody knew of another case, and the English member had forgotten the publication of Warren Tay. The case of the reviewer is published in the *Transactions of the Heidelberg Society*.

retina. The hyperæmia, swelling, opacity, size, the configuration of the vessels, the pallor, the physiological, glaucomatous, and atrophic depressions are of very great importance (illustrated by three text-cuts, with description). The elevation of the disk or other parts—exudation, tumors in the background—can be measured by the direct method of ophthalmoscopy: 3 dioptries indicate 1mm of elevation or depression in relation to the basis (the retina) of the background; for each dioptry difference of refraction between two surfaces, 0.34mm is to be taken into account. This method is very useful, but the doctor must be able to relax his accommodation during the examination. The deduction is easy. The reviewer had—one of the first—drawn attention to this method in his monograph on *Intraocular Tumors*, 1868 (out of print). It is nicely described in Haab's *Ophthalmoscopy*, in English by De Schweinitz, W. B. Saunders & Co., Philadelphia, p. 44, to determine irregularities in the surface of the eye-ground. The descriptions of the manifold very important anomalies and diseases are all sufficiently numerous and precise to study and treat them. Some of them may be mentioned by title: Swollen disk, stage of swelling or constriction of the circulation, effusion or cell proliferation, stage of resolution or absorption and atrophy, optic neuritis—ascending and descending, intraocular optic neuritis, vision and visual field, cause and course of papillitis, with a reproduction of 677 cases of papillitis accompanying brain tumor, by John E. Weeks, presented at the Section on Ophthalmology of the American Medical Association, Columbus, O., 1899. A colored Plate (IX.) is not typical, representing **“atrophy of the optic nerve (post-papillitic atrophy), also medullated nerve fibres.”** The execution is excellent, as all the productions of Margaretha Washington are, but the selection is unfortunate: the reviewer, even by looking intently, could not make the diagnosis of the conditions designated under the picture. Plate X., **Spinal Atrophy** (Argyll-Robertson pupil). The artist, in painting the od had not thoroughly cleansed the brush with which she painted the previous picture. Both these pictures are too beautifully blue-green, though these vivid colors are seen at times.

Chapter X. **Diseases of the Choroid; Glaucoma.** Changes in Color. Inflammatory Products. Changes in Pigmentation. Atrophy. Hemorrhage. Inflammation. Disseminate Choroiditis. Plate XI., good. A multitude of small gray inflammatory patches,

which gradually run their course, ending in such a degree of destruction that you thought there could not be much sight expected, but the sight is mostly surprisingly good.

In the same way a number of small ivory-like nodules are imbedded in the choroid ("Drusen" in German). Tay's choroiditis: small, white, glistening dots are called senile guttate choroiditis, and are due to colloid degeneration. They also are not so injurious as they appear. I have seen them for many years, not changing much and excessively slow in growth. The central or macular choroiditis is a senile degeneration.

Myopic Choroiditis. This is a serious condition, brought about by stretching or elongation of the eyeball. The choroiditis begins usually on the temporal side of the disk, advances toward the macula, which it may destroy and pass beyond.

Irido-choroiditis, metastatic, is an incurable disease, and ends in panophthalmitis, as we have seen before.

Isolated ruptures of the choroid are produced by blunt force. They are mostly single, but also two and even three occur: small dilacerations of the choroid, concentric with the temporal margin of the od; the retina is mostly uninjured. They do not produce choroiditis, but do not unite either. The mode of this isolated rupture has produced several explanations. The reviewer, thirty-three years ago, advanced the hypothesis that it was like the mechanism of the laceration of the meninges and the fracture of the bone by contrecoup. The late Professor Arlt opposed it, but had not much support for his rather complicated theory. They never suppurate or jeopardize the other parts of the eye.

Sarcoma of the choroid is, or becomes always, pigmented. It is easily diagnosticated. Treatment: enucleation. Course: gradual metastatic invasion of the liver or other parts; and death is invariably the end. The time may be after many years. I have had patients that died fourteen years after the operation, and one lady died April 14, 1906, twenty-five years after the operation. These are exceptions, and I can say that the size of the tumor has no influence on the duration of life. I have had patients in middle life, and healthy-looking appearance, with very small melano-sarcomas, who did die in a few years.

Tuberculosis of the choroid occurs either as the disseminate (miliary) tubercles or as solitary (conglobate) tuberculosis.

Glaucoma ends the last article, with a plate of the background, of this useful book.

H. K.

III.—**Subjective Sensations of Sight and Sound.** By Sir WM. R. GOWERS, M. D., F. R. C. P., F. R. S. Lectures on Disease of the Nervous System. Second Series. Philadelphia: P. Blakiston's Son & Co., 1012 Walnut St., 1904.

"These lectures have appeared in print at various times and are now republished, carefully revised, with the intention to promote such observations. The substance of the first lecture has been rewritten, and its matter rearranged in the light of later experience, which, however, has not modified its chief conclusions. There is indeed a prospect that our ultimate conceptions may be thrown into crucible, and recast by ardent thought, through the discoveries regarding radio-activity, and the possible nature of the elementary constituents of matter, without altering the coarser facts. All that has been demonstrated on atoms and molecules, and the relation of energy, latent or released, remains true."—*Extract from Preface.*

LECTURE I. The Bowman Lecture, June 11, 1895.

Physiological Considerations on Subjective Visual Sensations. In 1885, Gowers put forth the opinion, now generally confirmed, that, in addition to the half-vision centre in the occipital lobe, demonstrated by Munk, the indications obtained by Ferrier are correct, and that there exists a higher visual centre in the region of the angular convolution, a centre which immediately subserves the perception of visual impressions [memory or conceptive centre], and to which impulses seem to pass from both half-vision centres in the occipital lobes, in such a way that in each higher centre both fields are represented, but that of the opposite eye in greater degree. In the strange hemianæsthesia of hysteria we have evidence of arrest of all the higher special sense centres in one hemisphere. Instead we have the "crossed amblyopia," as it is termed: peripheral vision is lost in both eyes; centre vision persists in a small area in the opposite eye, and in a larger area on the eye of the same side. No trace is found of any half-fields. But hysteria is a by-word, and all facts, however definite, with which the name can be connected are disregarded by physiologists. Yet they are definite, and must depend on equally definite fractional arrangements. Moreover, the same affection of vision occurs in organic disease.

Color Vision. Subjective visual spectra frequently present colors—red, blue, yellow, and sometimes green. The author

says that in disease the breadth of the field is as large as white. He mentions a patient of his, an epileptic, in whom the aura of the fit was uniformly a sensation of a green color over the lower half of the field of vision, from side to side. The patient said spontaneously it was "as if I were standing in a field of grass." The author gives the diagrams of the color-fields.

I. Visual Sensations in Migraine. Migraine belongs to a lower class than those of epilepsy. The attacks may soon become complex but are comparatively simple. The epileptic visual auras are extremely brief, lasting a few seconds, and are loss of consciousness, and convulsions. The migrainous sensation is deliberate, occupying $\frac{1}{4}$ to $\frac{1}{2}$ h., and is followed by a headache lasting hours. In rare cases similar sensations occur as an isolated symptom, no headache.

The sensations are long, but peculiar; crude in nature—*i. e.*, low in the scale of sensory perceptions. No visions of faces occur. The sensation, simple in character, is remarkable in form; the simple elements develop in the most complex combinations, and give rise to spectra that are extremely curious, and will one day, I doubt not, be most instructive. For this instruction, much observation and comparison of facts are necessary.

The Expanding Angled Spectrum has been studied by Dr. HUBERT AIRY on himself, and published in the *Philosophic Transactions of the Royal Society for 1868*. The plates have been reproduced in Dr. Liveing's admirable treatise on Megrim.

Special Features of Migrainous Spectra—The spectra of migraine present the zig-zag or angled character which is called the "fortification spectrum," with well-known curved characters. The visual discharge of migraine is usually accompanied by a process of inhibition of function, so that the picture is of a blue and red broken line in an oval.

Radial Spectra. An area of darkness developed in the outer-lower part of the field; within it was a bright zig-zag of white light. An excentric star in black surroundings; a bright star in a dark field; a large dark area moved out of the luminous field.

These spectra may show the visual prodromi of the attacks of migraine and become the warning of the epileptic fits, in more rapid evolution.

Hemianopsia. The inhibitory loss of sight, described by the late Prof. Förster, of Breslau, under the names "amaurosis fugax" and "hemianopsia fugax," Gowers states never having

seen in these temporary hemianopsiæ with the complete half-field as in organic hemianopsia. All he could verify was a partial dimness of sight. The subject needs further careful investigation.

Central Spectra begin at the centre and expand evenly round, one-sided with Airy's fortification spectrum limiting itself by the zig-zag on one side, whereas the remainder of the periphery fades away on the other side. At times they enlarge vertically on both sides; they are black, and sharply limited. Whenever the limiting bright spectrum appeared, the headache which followed was always on the other side of the scotoma. We may thus assume that the pain was on the side of the hemisphere chiefly on the process of discharge.

Pericentral Spectra. A man (Beck) writes: "When sitting down to dinner, the zig-zags colored red and blue, suddenly appeared, surrounding the edge of the plate before me. As I looked curious, my wife said: Why do you not carve? On taking my eyes off the plate I said to them: The zig-zag rainbow colors are gone out of the window." This fact is more important than may at first sight appear, because the form of the spectrum was evidently determined by the actual stimulation of the visual centres.

II. Visual Sensations in Epilepsy. A visual sensation or visual loss is common as the immediate warning of the onset of an epileptic fit—that is, the first effect on consciousness, of the cerebral cortex. Loss of sight, observed as sudden darkness, is always bilateral. The simplest forms are: (1) a sudden appearance of light or color; (2) sparks or stars, small and often numerous; (3) sometimes a larger luminous object is seen, round, stellate, often colored, commonly circular; after a few revolutions, consciousness is lost. In one case, as consciousness began to fail, a most offensive smell was experienced, always the same, but indescribable.

Psycho-visual sensations are definite sensorial conceptions of figures of persons or faces or scenes [phantasms].

Associations. Visual sensations may be associated with subjective sensations of hearing, very seldom of smell.

I have already mentioned the remarkable fact that the sudden spontaneous activity, which we will call "discharge" of the centre, is often preceded by sudden arrest of function, by inhibition. In one case, suddenly all became dark, then there appeared a red

sight before the eyes, changing to green, then consciousness was lost and the convulsion (in an epileptic) came on.

III. Miscellaneous Sensations. Spontaneous activity of the visual centres, giving rise to a sudden light, or color, or to the impression of some seen object, sometimes occurs in abnormal cerebral states apart from epilepsy and migraine.

Vertical Hemianopia.—The blending of the visual centres in the two hemispheres is strikingly evident when subjective functional disturbance has a distribution, not from one side, but in the vertical direction, of which I have mentioned a case before, in which the aura of the epileptic fits was green in the lower half of both eyes. In the cases which the author has seen the loss has been in the lower half.

Conclusions.

Far more observations, precise and detailed, are needed to enable any definite inference to be drawn regarding the indications of the phenomena here considered. We may learn much on the action of the cerebral centres and the relation of the positive spectrum to the inhibitory darkness. Yet the question presents itself again and again.—To what part of the visual centres are these phenomena to be referred? One conclusion seems correct: they must, in most cases, depend on a functional fusion of the centres in the two hemispheres, and that the higher visual centres are the seat of the disturbance.

IV.—The Optical Dictionary, an optical and ophthalmological glossary of English terms, symbols, and abbreviations, together with the English equivalents of some French and German terms relating to physical, physiological, and abnormal optics, optical and other instruments of precision, and terms descriptive of color and photo-chemistry, to which are added a number of general and mathematical expressions. Edited by CHARLES HYATT-WOOLFE, F. R. P. S., editor of *The Optician and Photographic Trades Review*, etc. Philadelphia: P. Blakiston's Son & Co., 1012 Walnut Street. 1904. Price \$1.

This long title-page gives the contents of the small 8vo volume of 165 pages. The print is excellent; the words to be explained are in larger heavy type; the explanations are very good. It seems to be a complete collection of the foreign and rare words. The little book will be a great help to everyone that has anything to do with optics and kindred subjects. H. K.

V.—**The Physician's Visiting List** (LINDSAY & BLAKISTON'S) for 1906. (Fifty-fifth year of its publication) The Dose-table herein has been revised in accordance with the new U. S. Pharmacopœia (1900). Philadelphia : P. Blakiston's Son & Co., 1012 Walnut St. Price \$1.

This compendious and neat pocket-book is very well arranged, and not too bulky. There is an introduction containing incompatibilities, the metric system, table for converting apothecaries' weights and measures into grams. Dose-table, Asphyxia and Apnœa, Comparison of Thermometers, Table for Calculating the Period of Utero-Gestation. This, in our estimation, is one of the most practical *Vade-Mecums* for physicians.

H. K.

VI.—**Diseases of the Eye, a Handbook of Ophthalmic Practice for Students and Practitioners.** By G. E. DE SCHWEINITZ, A.M., M.D., Professor of Ophthalmology, Pennsylvania University, etc. Fifth edition, thoroughly revised. W. B. Saunders Comp., Philadelphia and London, 1906. Price \$6.00 net.

This text-book of 894 pages, with 313 illustrations and six chromo-lithographic plates, in its new edition, can be placed among the best, that may be called classical—for instance, that of Wm. Mackenzie's (of Glasgow) *Practical Treatise of the Diseases of the Eye*. It was written before the ophthalmoscopic era, but it is to-day a classical book, and if any one can obtain a copy of it he will prize it highly. Mackenzie was a well-educated man, a keen observer, a classical writer. All that could be found with the means of research at his time he detected, and described it so that the reader of to-day will be delighted to read it, particularly his perfect case-taking. He is in every oculist's memory as the discoverer of that dread disease, sympathetic ophthalmia, of which we have no fuller knowledge than he had. It probably has a new nosological principle, to the discoverer of which the Graefe medal is sure. In France, Panas; in Germany, Fuchs, occupy the same rank. The text-book of De Schweinitz is complete, for our time. He has taken pains to avoid omissions and shortcomings. The titles of the new special paragraphs fill a whole page. The last edition, of 1902, had 773 pages, 121 pages less than the present. The clear and attractive style, the superior typography and illustration, will please every reader; apart from this he will find what he seeks, and what he can

use. To go critically over this large volume need not be done now, only a few remarks in the operative part, and specially of the management of cataract, may be given. I will only premise that this chapter, like the others, is very good, and complete.

Page 806, **Accidents.** The knife may be introduced with the cutting edge turned in the wrong direction. If this "somewhat inexcusable mistake could occur," the knife must be withdrawn and properly inserted. The first oculist to publish such a mistake was very sharply criticised. The critic was a New York eye-surgeon, the perpetrator also. The latter did not excuse himself, for "the somewhat inexcusable mistake" happened him twice more. He did not publish the two later mistakes, but published the first, and also the correction. He was not dismayed, but he said to the students who watched the operation, "Look here, the cutting edge is below"; then he simply turned the Gräfe knife 180° round and finished the operation as if nothing had happened. Soon after, there came Dr. Santos Fernandez, in Habana, a very good cataract operator, to publish the same accident. He gave the advice, in such an accident, to remove the knife and postpone the operation. Since that time I have seen that the rule of Santos Fernandez, to remove the knife, has been indorsed. The perpetrator who first came out with the confession, was the reviewer. The two other accidents were treated in the same way, and all three had no reaction whatever and the patients had good sight. Our author is more lenient with the reviewer. Every avoidable blunder is more or less inexcusable, but to most of us poor mortals that see a great deal, everything is liable to occur. My first accuser had not a great opportunity to turn the cataract knife topsy-turvy. I hope that this communication will have the effect, not to withdraw the knife but to turn it. To withdraw the knife, and immediately to properly insert it, the reviewer would like to know whether the anterior chamber remains filled, and how accurate the section may be made?

Page 811 the author mentions **spongy or gelatinous exudate.** This is a fibrinous exudate and occurs by traumatism, in syphilis, and metastatic gonorrhoeic irido-choroiditis. It is without danger, and may be diagnosed by the mildness of the inflammatory irritation. There is a fibrinous exudation, at times a streak of discharge on the gauze when the first dressing is taken off. If there is no pain, and the edge of the upper lid is not red and swollen, even when the edges of the section are somewhat infiltrated, it is not necessary to disinfect vigorously.

Page 11. **Herpes corneae, filamentous keratitis,** is rare, and not dangerous. Light treatment. **Prolapse of iris:** In simple extraction to inspect the wound the day after the operation, and when it is present, to excise it cleanly; if it has

been present more than 1 or 2 days, the abscission is apt to engender a traumatic iritis; better to leave it, and when they are large to cut them off, like an old staphyloma. To avoid it I always, in the first night, let a trusty nurse watch at the bed so that the patient be quiet. Now to **prevent the prolapse**: 1st lay the corneal section not so far backward, but nearer to the limbus corneæ than to the sclera. Small excisions or even small periphering incisions prevent prolapse considerably (Chandler in Boston, the late Schweigger and Pflüger in Europe). It is not so essential to spare the iris: small excision is a positive prevention and has no unpleasant consequence. Large iridectomies are not desirable, and if they are downward, they are a nuisance.

A good deal might be discussed on the treatment of the after-cataract. Yet this is well described.

The book has an excellent index of 52 double columns, an immense help to use the work as a reference book.

H. K.

VII.—**Biographic Clinics**, Vol. III. Essays Concerning the Influence of Visual Function, Pathologic and Physiologic, upon the Health of Patients. By George M. Gould, M.D., Editor of *American Medicine*, etc. Philadelphia: P. Blakiston's Son & Co., 1905. Price \$1.

In the Introduction the author says that the examination of 7166 school-children in New York City in 1905 showed that 1273, or more than 17 %, were suffering from defective eyesight of the worst or most evident kind: bad nutrition, nervous disease; cardiac, pulmonary, skin diseases; deformity of the spine, the chest; bad mentality: total cases requiring medical attention, 3132.

Then the number and kind of anomalous refraction and their prejudicial influence on the health of the whole body, and special organs, are discussed.

The next chapter treats on the "New Ophthalmology"; and its Relation to General Medicine, Biology, and Sociology is considered under the influence of Eye-strain. The effects manifest themselves mostly in depression and other affections of the nervous system. Errors of Refraction and Motility are raised by the author so high that it deserves the name of "The New Ophthalmology." This symptom of the errors of refraction is certainly very important, but there are other diseases of the eyes no less important—for instance, cataract, the conjunctivitides: blennorrhœa

and trachoma, etc.; further, the eye-ground diseases, for instance arteriosclerosis, which can be so well diagnosticated with the eye mirror. This condition alone makes more people wretched than all the errors of refraction. It has some symptoms in common with errors of refraction—for instance, indigestion, headache (migraine), asthenopia, and other distempers. These patients are not all hyperopic or astigmatic; their remedy is: diet and exercise. The new or modern ophthalmology is the progress in all branches of ophthalmology, in which the Americans have their share.

Dr. Gould's third volume, like the two others, will be read with pleasure and profit, for his style is attractive and persuasive, in which positiveness is a prominent feature, all of which are captivating qualities. H. K.

VIII.—**The World's Anatomists.** By G. W. H. Kemper, M.D. P. Blakiston's Son & Co., Philadelphia, Pa. Price, 50 cents.

This little 12mo, of seventy-nine pages, of the Professor of the History of Medicine in the Medical College of Indiana, Indianapolis, Ind., is very interesting. It gives sketches of the work of all the prominent anatomists, whose names are found in our text-books of anatomy and physiology. It is interesting to learn the lives of the men that have laid the foundation of medical science and practice. The print of the booklet is clear, embellished with eleven illustrations, nine of which are portraits. The low price is surely an inducement for almost any physician to buy it, especially the Americans, who study anatomy with great zeal. H. K.

IX.—**The Ophthalmic Year-Book for 1904.** By EDWARD JACKSON, Denver, Col., and GEO. E. DE SCHWEINITZ, Philadelphia, Pa. Illustrated. The Herrick Book and Stationery Co., Denver, Col., 1904. Price, \$2.

A very well-gotten-up book of 250 pages of text and 68 of index. Issued in May, 1905. The illustrations are few but good.

Dr. JACKSON contributed the first part: Eye-strain, Refraction, Motility, Retina, Optic Nerve, Tracts, and Centres, Lens, Vitreous, Tears, Lids, Orbit and Adjoining Sinuses, General Ophthalmology.

Dr. DE SCHWEINITZ: Conjunctiva, Cornea, Sclera, Pupil, Uveal Tract, Toxic Amblyopias, Glaucoma, Tumors, Injuries, Sympathetic Diseases, Operations.

This digest of ophthalmological literature is arranged according to subjects, "Sammel-Berichte," which is a great advantage for general information, if the time of issue is not important for the reader. The well-written and very valuable book will be read by every English-speaking ophthalmologist with pleasure and profit, as could be expected from the names of the eminent authors. We can select only a limited number of specimens to show the high character of the work.

The first article is *Eye-strain*, according to a symposium held in the New York Academy of Medicine last year. Dana distinguishes two kinds of eye-strain: (1) the automatic effort of the mid-brain and oculomotor nerves, which does not generally involve conscious mental effort; (2) a distinctive and fatiguing effort is made to supplement the mechanism of the eye, and the sensation of which may cause distress. He dismisses the first as of little importance; the other, the real eye-strain, is a kind of tension, or brain-strain.

DE SCHWEINITZ contributes a very fine *ophthalmoscopic chromo* (frontispiece) in a woman, sixty-six years old, with chronic heart disease and arteriosclerosis. $V = \frac{8}{8}$, gradually, in nine months, $\frac{4}{8}$. A year later the other eye began to suffer in the same way. Such ophthalmoscopic pictures have been published by Haab and a few others under the name of round, hole-like defect in the macula of the retina, of traumatic origin. De Schweinitz's case followed iritis.

The reviewer has seen several cases of that kind; they were the result of degenerative choroiditis; the most characteristic case, which was under his care for two years, was probably produced by excessive use of her eyes. The patient, of twenty-nine years, was a teacher of a high-school for young ladies, somewhat frail and anæmic, but very ambitious. Among other branches she taught Sanscrit, which she greatly liked. The ultimate condition was a round perforation, with inability to read with that eye. I restricted her in her work; for six weeks no use of her eyes; then she was allowed to teach again, but with utmost caution. In a year, when she had used her eyes again without letting me know, she came again. The other eye showed a degeneration in the fovea; fine atrophic dots, just as the other eye had begun. I told her she should give up her position now, not wait until this eye had reached the condition of the other. She did it, and for a year she never tried her eyes for fine seeing. The disease did not progress. She married afterward, and showed me her eyes again from time to time. The disease had been arrested.

The next subject is **Refraction**, beginning with the Skia-kinescopy of Dr. HOLTH. *Cycloplegia*, by DE BECK; *Myopia*; *Light Sense*; **Myopia** and **Glaucoma**. *Full Correction*, CLARK. *Operative Treatment*. **Astigmatia**. **Accommodation** (nothing particularly new or important). **Ocular Movements**. Systematic examination. Binocular vision. Paralytic squint. Recurring oculomotor paralysis. Ophthalmoplegia external (illustration). Bielschowsky's case of *paralysis of the right inferior oblique*. The **conjunctival diseases** receive a careful consideration (DE SCHW.), both in etiology and treatment. In **conjunctivitis gonorrh.**, especially in neonati, the stronger remedies gradually yield to the weaker solutions, argyrol, etc. In trachoma, copral, a copper-nucleid, is indorsed in a 5 % solution, or in powder or a salve, for the treatment of trachoma with pannus. **Parinaud's conjunctivitis** is well described; for vernal conjunctivitis, Wicherkiewicz proposes the better term "periodic hyperplastic conjunctivitis." **Conjunctivitis nodosa**, caterpillar conjunctivitis, is tersely dealt with by a case of DE SCHW. and SHUMWAY, with a typical illustration of what is called **foreign body tubercle**.

The **cornea** receives 30 pages (DE SCHW.). MORAX endorses the statement of Fuchs, that ring abscess is mostly traumatic; the cellular infiltration of the cornea is anaërobic. The infectious matter is transmitted through the wound into the globe, and attracts the leucocytes in the aqueous to adhere to the posterior side of the wound; purulent infiltration or sloughing is the consequence.

Infected Ulcers of the Cornea and its Varieties, usually called **Serpent Ulcer of the Cornea**, is considered by Dr. ZUR NEDDEN. (a) **Infected Marginal Ulcer**: superficial, narrow, gray infiltration clearing up. Cleanliness is all that is wanted. (b) **Corneal Ulcer from Bacillus Pyocyaneus**. Found by McNAB in a case of hypopyon keratitis; further, two cases have been described by Prof. SATTler of Leipzig, and one by BIETTI; the germ is unusually virulent. Early incision (Saemisch's) best to prevent panophthalmitis. If not very extensive, galvanocautery points successively along the infiltrated margin stops the progress with more preservation of available cornea in the majority of cases. [H. K.] (c) DE BERARDINIS asserts from his investigations that streptothrix is the cause of many corneal ulcers which frequently are moderately severe. (d) DE BERARDINIS has

found the bacillus coli in severe corneal ulcerations. (*e*) Corneal ulcer is caused by the *diplobacillus* (Morax-Axenfeld) oftener than supposed. (*f*) Dr. KIPP describes corneal ulcers, central or paracentral, with infiltration lines radiating all around the edges of the ulcer, and in severe cases connected together by transverse lines. He speaks well of mild treatment, warm borated fomentations and atropine.

RÖMER's pneumococcus-serum, acquired from Merck, has been used by several experienced oculists, with good results in the recent cases, whereas the advanced ones were not benefited, and had to be treated with galvano-cautery and Saemisch's incision. Yet they all say they would use it, and expect that the older, unfavorable cases now would be rarer, as they could be cured in the beginning. The other affections of the cornea are reviewed as to what is new in diagnosis and *nosology*, and treatment is properly considered. Darier described a new form of heredito-syphilitic keratitis. They have a dental deterioration differing from the Jonathan Hutchinson ones by affecting the four molars, which terminate in four tuberculous points. By an arrest of development they are insufficiently covered with enamel, and the yellow dentine is exposed, which proliferates into several more or less points. They shrink by exposure, are of great fragility, and disappear rapidly. Interstitial keratitis may be caused by injury. Stanculeano found in a case, which he had diagnosed as parenchymatous keratitis, an *ulcus internum*, Descemet's membrane defective, as well as the adjacent posterior layer of the cornea.

The **grill-like corneal opacity** which was first described by BIBER and HAAB, the grill-like keratitis, also called trellised opacity, or lattice-form opacity. It is hereditary. There is a neat, sharp picture in the text. Nodular or punctate keratitis, deep-seated keratitis, and different rarer forms of keratitis have been described. *Dionin* has become a popular remedy; 5%, rarely stronger, is frequently used now, owing to its analgesic action.

A number of remedies have been used and recommended, but with doubtful use. Conical cornea is to be benefited by glasses, and a number of operative procedures, complicated, more or less irrational; the judicious galvano-cautery is still the best method. The recommendation of ANDERSON CRITCHETT to go on gradually, first a superficial cauterization, and then deeper, is superfluous in the experience of the reviewer. If you practise it alone, it has no effect, the epithelium regenerates itself even

without an opacity. The reviewer finds the cauterization with a small platinum disk the best. How deep we should burn, is a matter of experience. If the cornea is pierced, there will be no harm done, though it is not necessary. The after-treatment should be careful, so that there will be a clean scar, without suppuration. The eschar will leave a clean scar. The **pupil**, so important in diagnosis of nerve disease, is studied with great zeal, but clear results are still lacking on most of the important questions. The literature is extensive, and the experimentation delicate and very difficult; the report is adequate. **Uveal tract.** C. H. Williams (p. 106) treated a relapsing case for 5 months with 30 applications of bromide of radium 3 times a week, held just clear of the eyelashes with the eyelids open for about a minute. In a month's treatment the cornea showed clearing and V increased to 0.1, finally 0.5. Williams will not say that the improvement was due to the radium, but the case shows that pure radium can be used around the eye without danger.

Tuberculosis of the uveal tract has been described by several authors: v. Michel, De Schweinitz and Shumway, Pooley, Posey, Abadie, Heath, and v. Hippel. The diagnosis has often been confirmed by tuberculin injections T. R., as it is the main remedy. Enucleation is not imperative. The results are very good. v. KIPPEL records 14 cases. **Syphilis.** EWETZKY's monograph, Syphiloma of Ciliary Body, quoted. ALT and KIPP mentioned, the permanently successful cases of STIEREN and H. KNAPP omitted, *Fourn. A. M. A.*, Convention of Atlantic City in 1903.

Diseases of the Retina, compiled by JACKSON. Rarer conditions are mentioned; transient blindness, unilateral, from disturbed circulation; man aged eighty-four; recurrence of blindness for five hours. Dr. JAMIESON saw with the ophthalmoscope the arteries getting smaller and smaller, so that they were invisible; opt. disk perfectly pale. Dr. Jamieson supposed that the difficulty was transient arterial spasm.

Retinal hemorrhage studied by Dr. COBURN. **Retinal hemorrhage**, following compression of the chest; in diabetes. Hemorrhagic retinitis, caused by renal thrombosis; from tapeworm. Anæmia, with hemorrhage; visually not impaired. MIL-LIKIN: Dilatation of the retinal vessels; a case of peripheral tortuosity of veins, "crinkled," in renal and diabetic disease

(black ophthalm. picture); arteritis and retinal ischæmia, by arteriosclerosis, of men of twenty-three and twenty-eight, and other vascular retinal anomalies; neuro-retinitis in chlorosis; eye-strain retinitis; retinal degeneration with idiocy; treatment of detachment of the retina.

Diseases of the Optic Nerve. Pseudo-retinitis is described by many authors. It can be expressed with the sentence that the aspect of the optic disk and retina has a large latitude, simulating neuro-retinitis. Particular attention to it should be given in the ophthalmoscopic and clinical courses; nevertheless, it is not superfluous to point them out in print: Optic neuritis; *optic atrophy*, arteriosclerosis as a cause, as dwelt on by C. S. BULL (*Ann. of Ophthalm.*, Jan., 1904). Peripheric atrophy (FUCHS), septa running from the pial sheath and the lamina cribrosa into the nerve, about 15mm back. Kiribuchi (ARCH. OF OPHTH., Nov., 1904), from a careful study on the subject, finds that septa also exist in the nerve near the optic foramen. Hereditary optic atrophy, traced by Arnold Knapp through three generations; 8 cases, ARCH. OF OPHTH., July-Sept., 1904. Optic atrophy with tower (or steeple) skull (oxycephaly). Enslin reports 26 cases, adds 2 of his own (*Gräfe's Arch.*, lviii, 1, 151). Description with 2 illustrations, p. 135. Vessels of optic disk in lower animals. Nettleship, by an anatomical study, has supplemented the ophthalmoscopic work of Lindsay Johnson with regard to the distribution of the retinal vessels in the lower animals.

Cavernous Degeneration of the Optic Nerve. SCHNAUDIGEL, O. (*Gräfe's Arch.*, lix., 2, 344). In an eye first seen in an attack of glaucoma, and which then presented a blood-red appearance of the optic disk, Schnaudigel found a cavity formation in the optic disk (Fig. 9, p. 136). He believes that this condition arose from an apoplexy of the nerve in which the hemorrhage was broken up. The subsequent changes in the cavity formation resembled those after cerebral hemorrhage, or in the spinal cord in traumatic syringomyelia.

Hyaline Bodies (Drusen) of the Nerve Head. CIRINCIONE (*La Clinica Ocul.*, March, 1904), after microscopic examination of two eyes, does not think that they always follow an inflammation. He found no destruction of nerve fibres by them. He thinks they must develop slowly, so that the nerve fibres can adapt themselves to the displacement caused.

STREIFF (*Klin. Monatsbl. f. Augenheilk.*, Feb., 1904) has studied six cases in Haab's clinic. He likens them to the concretions found in the dura mater and the dural sheath of the optic nerve. Most of his cases showed marked choking of the disk, and all gave some evidence of preceding neuritis.

Cortical Visual Centre. A most important case which Beevor and Collier watched for two years, in which the sole manifestation of gross nervous disease was blindness of the left upper quadrant of both fields, the fixation point and the lower quadrant escaping. A careful autopsy showed occlusion of the right posterior calcarine artery, causing destruction of the cortex of the posterior rim of the fusiform lobe, the lingual lobe from the junction of the calcarine and parieto-occipital fissure backward, the whole cortex in the depth of the calcarine fissure, and most of the inferior part of the cuneal gyrus. The necrosis did not involve the optic radiations; the upper two-thirds of the cuneus and the anterior ventral portion of the fusiform lobe escaped (*Brain*, xxvii., 153-162).

HINSCHELWOOD (*Ophthalm.*, Oct., 1904) reports a case of right homonymous hemianopsia with word-blindness. Patient was under observation nine years. **Autopsy:** At the lower aspect of left occipital lobe a triangular area sunken by atrophy, filled by 3 drams of clear fluid, covered by pia mater. The portion of destroyed cortex was triangular, limited internally by calcarine fissure, externally by the third temporal gyrus and the point of the occipital lobe. Angular gyrus intact. The patient had been able to write, but altogether unable to read, supporting the view that the cortical visual centre was intact, but the sub-cortical fibres coming from it were affected.

Other cases of cortical lesion were reported by Gamble, Goldzieher, Wernicke, Lechner.

PICK (*Am. J. Med. Sc.*, January, 1904). A remarkable case to show that hemianopic hallucinations may be produced by localized focal or functional affections in the optic tracts.

HEINE (*Gräfe's Arch.*, lix., 1, 189). Recovery of **Amblyopia ex Anopsia**. Girl, fourteen years; convergent squint; lost fixing eye by injury. Glass correction brought deviating eye to $\frac{1}{3}$, and after a year's use to normal acuteness.

Toxic Amblyopias.

BULLER, F., and WOOD, C. A. **Poisoning by Wood Alcohol.** *Montreal Med. Journal*, 1904, Jan., 397, and *Journ. Am. Med. Assoc.*, 1904, 117, 972, 1058, 1213.

A thorough investigation authorizes the authors to 17 conclusions, of which we abstract what appears more important. Methyl, or wood alcohol, in any form is dangerous to life and sight; thus far 122 deaths, and 153 cases have been known from its use. It causes blindness by a destructive inflammation of the optic-nerve fibres and retinal elements, followed by atrophy. Symptoms: Derangement of stomach and bowels, accompanied by vomiting, dizziness, headache, blindness; if fatal, depression of heart's action, delirium, and coma. The blindness is bilateral; may occur a few hours after the imbibition or in a few days. Contraction of the visual field and absolute central scotoma are present. The diagnosis can hardly be mistaken: acute abdominal distress followed by blindness should always arouse suspicion of methyl-alcohol poisoning.

The prevention of poisoning by this insidious drug can only be brought about by prohibiting the sale of "deodorized" wood alcohol in all its forms. Methyl alcohol is one of those ingredients that are innocuous to some people, but in this case they are in the minority. Treatment: Chiefly to get rid of the poison from the stomach and intestines by the stomach-pump and rectal injections. The treatment of the ensuing blindness is unsatisfactory. Pilocarpine and K I, later strychnia.

Alcohol-Tobacco Amblyopia. Its pathology is still under controversy. SCHIEK, 1902: primarily an alteration of the blood-vessels within the optic nerves; as the centre of the nerve is more scantily supplied with blood, the central nerve fibres suffer first and most. UHTHOFF: continues to believe that alcohol produces an interstitial optic neuritis. Experiments with methyl-alcohol prove that the ganglion-cells in the retina undergo changes preceding the degeneration of the nerve fibres. There is an analogy between acute poisoning by methyl alcohol and the chronic poisoning of ethyl alcohol. Alcohol and nicotine produce not only central scotomas, but also, not quite rarely, paracentral and peripheric ones.

Crystalline Lens. Calhoun encountered in 10 months five cases of cataract in patients suffering from uncinariasis (book-

worm disease). These patients were greatly anæmic and had a very yellow skin, no malaria or albuminuria. Cataract manifested itself after other symptoms of the disease (which is not rare in the South) for 3-12 months. The cataracts were all cured, the younger by needling, the older by extraction. *Ophth. Rec.*, 1904, April No.

Sympathectomy has not increased its reputation as an efficient and permanently good treatment.

Lids. *Blastomycosis* of the lower eyelid, illustrated by a nice photo. Fishkin's lid (Wood). This skin disease (blastomycetic dermatitis, Gilchrist) on the lids produces an uneven nodular swelling, with a raised rim, and ulcerous central surface, implicating the eyelashes. The organism causing the disease is in miliary nodules filled with a viscid muco-purulent substance. A small portion of the secretion may be put on a slide and potassium hydrate, added to clear away other matters, leaves the organisms visible alone. The conjunctiva has not been seen involved in the process. Like epithelioma, it caused defects and eversion of the lid. Cauterization, rays, blepharoplasty; when superficial: unpedunculated skin-flaps; the remedies, according to the size and shape of the affection. Gilchrist described this disease as blastomycetic dermatitis. Cases on the lids thus far have been reported in America, the largest number from Chicago (Wood and Wilder).

Vitreous. CIRINCIONE, as most investigators have done, has given up the view of the ectodermic origin of the vitreous embryological researches, though the whole series of vertebrates have shown that its origin is mesodermic, from the lens and ciliary part of the retina. ADDARIO has found clefts in the vitreous, especially in its central part, which he terms a senile involution of the vitreous.

HIRSCHBERG calls attention to the remarkable decrease in the occurrence of intraocular cysticercus in Germany. Gräfe had 90 cases among 80,000 patients, Hirschberg 70 among 60,000 from 1869-1880; but from 1880-1894 among 78,000 patients he saw but 3, and from 1895 to 1902 none. In other eye clinics of northern Germany the same experience has been found. Hirschberg points out that meat inspection has been enforced since 1883. Beginning with one diseased hog in 150, since 1902 there have been only one in 3,000,—doubtless due to a general knowledge of the

cause of cysticercus, and the result should be ascribed to the precaution. In New York no cysticercus has been brought to the knowledge of the reviewer, and none from outside.

In the article **Glaucoma** the continuation of the discussion of the etiology of this disease shows that we are not yet at the solution of this great problem. Brown Pusey (*ARCH. OF OPHTH.*, 1904, March) bases it on osmotic disturbances (probably a hypercondition within the eyeball). Uribe Troncoso found excess of albumin in the aqueous, produced by an increased permeability of the degenerated vessel-wall to albumin. The reviewer gets the impression that there has been too much theorizing and too little clinical observation—for instance, the post-operative glaucoma, as it occurs in the operations for secondary cataracts by discission, which offers a typical picture of traumatic, say experimental, acute glaucoma, and its permanent cure by iridectomy, should be carefully observed and considered; further the anatomical condition of the uveal tract and the aspect of the retinal vessels should always be examined ophthalmoscopically, particularly as to vascular sclerosis; also the general condition of the body should be noted—diabetes, kidney troubles, syphilis, the condition of the heart, digestive distress. Next to this we should direct our attention to the pathological condition of enucleated glaucomatous eyes, and if we get any clew to resort to experimentation for glaucoma is not a distinct disease, as the infective ones, but a symptom like strabismus, which is produced by a disproportion of two functions of the eye to produce one determined object: refraction and accommodation to see an object distinctly. An anomaly of refraction is the given faulty condition which requires an insufficient or exaggerated effort to produce clear and binocular vision. There is no organic disease in those eyes, nor is the muscular strength too great or too little, neither the ciliary muscle, nor the external muscles, especially the lateral, internal, and external recti. This is a functional trouble, congenital; the eyeballs and the muscles are perfect. The difficulty is congenital, owing to a disproportion of the length of the eyeball for clear seeing; this entails an inadequate contraction of the muscle of accommodation, which induces the lateral recti to exaggerated or insufficient contraction. Glaucoma is not a congenital disease, and it seems not to be an affection by the function of a faulty proportioned constitution of the eyeball;

it mostly develops in later years, and therefore I would not consider it the consequence of faulty development, but rather an inflammatory affection, which in all probability develops by a chronic acute organic disease, and here I think vascular sclerosis is the most likely, and if there are more causes than one, this one appears the most frequent. This agrees also with the pathological investigations. This disease does not forcibly produce glaucoma, but is a predisposing condition. The accidental causes are manifold, causes that are sufficient in themselves, under other conditions, to cause glaucoma—for instance, traumatism. This idea is not new. It was clearly expressed by Dr. Bailey at the London International Congress (1888?).

Sympathectomy has not gained ground as a treatment of glaucoma. Serious after-effects have not been reported. It was followed by an acute relapse, requiring iridectomy. WEEKS and WILDER prefer making an iridectomy, and if this did have no good effect, sympathectomy might be done. UHTHOFF stated these results from iridectomy in chronic glaucoma: Improvement, 5 %; remained stationary, 45 %; slowly worse, 40 %; grew much worse, fully 10 %. ABADIE thinks the operation does not do much good. Myotics indicated, chiefly pilocarpin. FRÖHLICH advises to replace enucleation by Hippel's trephines of the sclerotic back to the ciliary body; diameter 5 mm. GRAND-CLEMENT is enthusiastic of adrenalin and eserine in *acute cases*. His formula is:

Adrenalin.....	3.00	grams
Eserin.....	.05	"
Water.....	10.00	"

to be instilled every half hour.

ROY (*Am. J. Med. Sc.*, January, 1904). Case of dislocation of the lachrymal gland. Has had another case before; could find no more than 12 others. If not troublesome, no treatment; otherwise, according to the condition.

MCGILLIVRAY had a patient with a **fistula of the lacr. gland**. A probe entered about 2 cm. There was stillicidium at times. He introduced an electrode of a galvano-cautery as far as it would go; then he turned the current on, and in an instant the whole fistula was cauterized and the cautery withdrawn. Recovery was complete, no tears passing any more, after having flowed several years (*Ophthalmoscope*, Feb., 1904).

BRONNER reports an **acute orbital abscess**. Pus was evacuated below on the seventh day; there was an **opening in the eyeball**; the latter was removed two days later for **panophthalmitis**.

E. C. ELLET (*Trans. Sect. Ophthal., Am. Acad. of Med.*) reports three cases of **acute septic thrombosis of the cavernous sinus**. All these cases proved fatal.

W. KRAUS (*Trans. Sect. Ophthal., Am. Med. Assoc.*, 1904); Intraocular disinfection by iodoform, *Z. f. Aug.*, xii., Sup. 97) collects and criticises the cases hitherto published, and reports 10 additional ones from the Marburg Clinic.

DE LAPERSONNE says **stovaine** (*Recueil d'Opht.*, May, 1904), a hydrochlorate of benzoic ether, is very soluble in water. A 4 % solution is as effective as cocaine; anæsthesia in 2-5 min., lasting 5-30 min. Injection, subcutaneous and subconjunctival, well borne and efficient.

MANOLESCU extracts cataract in the usual way, but replaces the iridectomy by an iritomy, making an incision with straight scissors perpendicularly to the circular fibres of the iris. It does not prevent prolapse. C. SCHWEIGGER did the same.

HÖDERATH performs **iridotomy in closed pupil, shallow anterior chamber, and aphakia** by introducing a long spatula through a small incision of the cornea, 2mm from the limbus, as far as the opposite border of the chamber; then he passes a very small Gräfe knife, 1mm broad, upon the spatula through the chamber; then he withdraws the spatula, and finally he turns the knife and cuts the iris with it.

GIFFORD made a large conjunctival flap in extraction of cataract, which was no better than a small conjunctival flap. Gifford considers the **danger of iris-prolapse too great** to recommend simple extraction at all. He prefers an iridectomy and above all, if possible, a preliminary one.

H. B. CHANDLER reports (*ARCH. OF OPHTH.*, June, 1904) 312, extractions with the **button-hole (small incision of the iris)** of about 1-2mm long, near the periphery. In this series there were only four cases with iris prolapse, all due to direct injury. The reviewer (H. K.) saw the operations of Chandler in the excellent eye hospital in Boston three years ago, and last spring by three other surgeons (Cheney, Standish, and——) in Boston at the meetings of the Am. Ophthalm. Soc. The technique in all of them was perfect, and there was no accident. The little

incision did not complicate the operation essentially, and most always closes without scar.

R. SATTLER, Cincinnati, O. (*Trans. Am. Ophth. Soc.*, vol. x., p. 342), reports the manner of ANGELUCCI, the **fixation by grasping the upper rectus with a fixation forceps**, and other simplifications in the operative technique. Such a tendency has often been described and tried with the recommendation of discarding assistants. They have never taken firm hold, as the ophthalmic hospitals are well supplied with assistants.

WICHERKIEWICZ reviews and recommends the principle of the **open treatment** after cataract extraction. He is not for total occlusion, but only so much as the secretions are not locked up. He had three infections in a series of 400 extractions.

F. DE LAPERSONNE and POULARD (*Trans. 10th Internat. Congress*, 1904) recommend early posterior discission after cataract extraction; sickle-shaped knife; opens about on the twelfth day. He introduces the instrument 2mm behind the summit of the wound, pushes it toward the centre of the eye, turns the knife so that the capsule is cut from behind, producing a V-shaped opening. (De Lapersonne has given the posterior opening up.—H. K.)

Foreign bodies within the eyeball, and magnet operation, are reported by several authors.

HAAB still uses the giant magnet in all cases, and draws the foreign body through the pupil, even when there is a scleral wound. The splinter never comes through the lens, but glides around the margin. In one case traumatic cataract was produced by scratching of the capsule.

SCHMIDT-RIMPLER prefers to draw the foreign body into the interior chamber behind the iris, then do an iridectomy, and finish the removal with a Hirschberg magnet. In these cases **he has seen total detachment of the iris.**

VON HIPPEL uses large and small magnets, according to the case. In 2 cases out of 57, a meridional incision was necessary. In one case the foreign body was drawn directly through the lens. (See Haab above.)

Professor MELLINGER, of Bâle, has devised a new magnet. The coil is wound at the peripheric part of a wheel; the centre part is empty, and receives the head of the patient. The current passes through the coil, magnetizes both the foreign body in the

eye and the iron mass held in front of the eye to attract the foreign body. Mellinger calls this the "**Innenpol-Magnet.**"

"The ultimate results are about the same in all the papers. After successful extraction, about one-fourth of the cases required enucleation, one-fourth retained sightless eyes, and about one-half were left with useful vision ; a few with full vision."

SCHWEINITZ's results are : Eyes saved with good V = 38.4 % ; eyes lost, 38.8 % ; eyes capable of being improved, 23 % ; phthisis bulbi, 7.7 %.

SACHS has constructed a lamp to illuminate the interior of the eye, according to the conduction of light along a conical glass rod, which is placed against the sclera and throws a strong beam of light into the eye, illuminating the pupil, so that the forceps need not be used in the dark.

Operations in the Orbit.

ENSLIN and KUWAHARA removed a panophthalmitic globe. The stump of nerve attached to the eye was free from inflammation. The eyeball was penetrated during the operation. The infection followed the path of the optic nerve to the optic canal, and was due to streptococci. The infection of the proximal end was caused by the contents of the eye during the operation.

J. WEEKS: Providing cul-de-sac for artificial eye (*Trans. 10th Internat. Ophth. Congress*, Lucerne, 1904). There is a good deal of instructive reading matter on the lachrymal apparatus, the diseases of the lids, on tumors; injuries, sympathetic disease, general ophthalmology, general operative measures, and a list of the publications during 1903 ; list of books, journal articles, index.

We can only say that this *Ophthalmic Year-Book for 1904* is a very valuable addition to the library of every American ophthalmologist, and, in other countries, to all that speak English. A good many inventions, clinical observations, and original modes of treatment may be found to their advantage.

X.—**Anleitung zur Augenuntersuchung bei Allgemeinerkrankung** (Introduction to Examination of the Eyes in General Diseases). By Dr. HEINE, Breslau. Pp. 142, small 8vo. Jena, Gustav Fischer, 1906.

The author in the preface states that he has endeavored to show how to examine a patient methodically in determining whether any ocular symptom is present of importance for general diagno-

sis. The methods of objective and subjective examinations are first described and include inspection, focal illumination, skiascopy, ophthalmoscopic examination, testing for site, field, and muscles. Under each of these headings the symptoms of the various general affections which produce ocular changes are enumerated. Dr. Heine, for many years first assistant of Prof. Uhthoff in the Breslau University Eye Clinic, is peculiarly well-fitted to write on this subject. The technical introduction to each method of examination is to our mind too brief for the beginner, though we agree with the author that technique can only be learned by practice, and for the experienced it is unnecessary. As for the clinical part, one is astounded at its exhaustiveness, and the number of facts given is almost bewildering.

The relation of general diseases and the eye has recently been brought to renewed attention by the new edition of Schmidt-Rimpler, and the second edition of Graefe-Saemisch, in which this subject is treated by Uhthoff and Groenouw. Both of these fundamental works are more for reference. Dr. Heine's little book serves well as a digest and fulfils admirably the many purposes which this class of book answers and will therefore better serve the educated ophthalmologist as a review than as an introduction for the beginner. The style is brief and to the point. We think that the book would gain by appealing to a larger circle of readers if it were not so condensed, though this brevity, so rare in text-books of the present day, can readily be corrected in subsequent editions. A. K.

XI.—Précis de Therapeutique Oculaire par Le Docteur SCRINI, Chef de Clinique Ophtalmologique de la Faculté de Paris à l'Hôtel Dieu. Préface du Professeur de Lapersonne. Paris, S. Stimheil, Publisher, 2 Rue Casimir-Delavigne, 1904. Price \$1.

"A la mémoire de mon vénéré maître, Ph. Panas, Fondateur de la Clinique Ophtalmologique de l'Hôtel Dieu."

Professor De Lapersonne has designated M. Scrini to teach the essential principles of Ophthalmologic Therapeutics, both medical and surgical. It is well known what large part is due to him in the adoption of the oily collyria.

Chapter I. **Asepsis—Mechanical Means:** They may be defined as "the rules of cleanliness," being ever so strict they could never be excessive. Washing the hands thoroughly with soap long and energetically; as to the patient, the operative region must undergo a like toilet.

Physical: Means I. Dry heat, in a kettle where we can have a temperature above 160° Centigrade. Instruments and bandaging material can well be sterilized in such a metal pot.

Moist Heat, for cutting instruments. A kind of stove is the autoclave de Chamberland with boxes for bandaging material.

Chemical Substances, antiseptics. **Technic or application of antiseptics.** Dishes, platters, flasks, goblets. Instruments, compresses, gauze, cotton, collyria, and salves.

Precautions of the surgeon and his aides.

Preparation of the patient.

Chapter II.: **Anæsthetics.** The different anæsthetics as the general: ether, etc., and the local: cocaine, etc. They are well described with all necessary details.

Chapter III.: The principal medicaments for the affections of the external membranes: Collyria, salves, called also moist collyria.

Antiseptics—Mercurials: biniodide of hydr., bichloride of hy., or sublimate, oxycyanure de mercure, hermophenyl, ichthyol, 1.00, vaseline 20.00. Eyelids and trachomatous opacity of cornea: acid picric 1.00 or 0.03, aq. dest. 100 or 30.00, boric acid, iodoform, iodol, methylene-blue, permanganate of potash, resorcine, tincture of iodine, etc. Tinct. iodi recent. 5.00, potass. iodi 0.50, glycerin depurat. xx gtt., one daily.

Emollients. Astringents: sulphate of zinc, oxide of zinc, alum, subacetate of lead, tannin.

Caustics. Silver nitrate, protargol, proteid of silver; sulphate of copper has been very popular. *Ne craignez pas le cuivre, le cuivre est l'ami de l'œil.*—Debrayne.

Cuprol, discovered by Schwickeroth. It is a combination of copper and nucleinic acid, nucleid of copper.

Substitutive Medication. Jequirity, jequiritol for old trachomas.

Mydriatics. Atropine, homatropine weaker, euphthalmine, scopolamine, ephedrine, hyoscyamine, hyoscyne, mydrol-mydrine, and others. To dilate the pupil for ophthalmoscopic examination, homatropine 1%, or euphthalmine 0.05 to 10.0.

Sulphate of Duboisine is slightly stronger than sulphate of atropine. Galezowski prescribes: Sulphate of duboisine 0.05., aquæ destillatæ, 10.00 (1:20). Homatropine 1% or 2% is much weaker, both as mydriatic and cycloplegic.

Euphthalmine is the weakest of all the mydriatics, and is, therefore, the most suitable for ophthalmoscopy. The author quotes Schultz as saying that euphthalmine had never been seen to raise the eyeball tension. This is unfortunately incorrect. Three or four years ago the reviewer had two or three cases which by instillations of 2 % euphthalmine, in his private consultation rooms, produced several genuine glaucomatous attacks which, with 1 % eserine, in two hours were cut short. At the same time, several American ophthalmologists reported the same experience. Nevertheless, euphthalmine, 1 % to 2 %, is the best mydriatic for ophthalmoscopic examinations. Euphthalmine is, however, almost equivalent for ophthalmoscopy and other purposes. It is somewhat weaker, more evanescent, and a weaker cycloplegic.

The **Myotics** are of more recent age; their origin does not date earlier than 1862. In 1853, Argyll Robertson discovered in West Africa the Calabar-Bean which possessed a myotic and cycloplegic action. Jobst and Hesse called the active principle **Physostigmine**, and Vee and Leven **Eserine**. Soon the identity of both was established.

The myotic action of eserine is attained in 25 to 40 minutes. The diameter of the pupil passes from its greatest diameter of 6mm to 5, 4, 3, 2mm, persists in this state, or becomes punctiform in certain subjects at the concentration of the solution. The author prescribed thus: Eserine pure, 0.10, sterilized olive oil, 10.0. Dissolve the eserine in ether, mix with oil, and heat on a water-bath of 45° Centigrade until the ether is evaporated. In New York the mixture is with oleum arachis (peanut oil) 1 %, which is very satisfactory. Laqueur of Strasbourg has taught us all the services we derive in glaucoma, acute, chronic, and secondary. They are recognized in other countries, and in ours it is used to prevent, arrest, and vanquish an attack of glaucoma, without the help from surgery. The remedy must be instilled, in 1 % solution, often at the beginning, then more rarely, in accordance with the progress of the recovery.

PANAS indorsed all that his assistant has written. He adds that eserine should be used when the operation becomes inevitable; the use of eserine is necessary before the operation, in order to prevent hemorrhage. After the operation, eserine is also indicated to prevent relapses.

Pilocarpine, weaker than eserine, in 2 % solution may be used in watery or oily solution. According to researches by physiologists, f. ex. Grünhagen, 1868, Adamück and many ophthalmologists: Coccius, Pflüger, Wharton Jones, Hasket Derby, Warlomont, Hirschberg, Laqueur, Wecker, Gayet, Weber, came to the conviction that the myotics acted by dilatation of the vessels of the eye, principally those of the iris and the ciliary body, and the mydriatics acted by contraction of these vessels. The mydriatics increased, and the myotics diminished—contracted—them. This antagonism is not so marked on the healthy eye as the pathological, more important in practice than in science.

Chapter V.: **Modifier of local circulations**, treats on the revulsives, derivatives, vaso-constrictors, and vaso-dilatators. The revulsives are almost all abandoned, though they were most popular among the physicians of all times, except the last four or five decades. The reviewer has seen such fossil contrivances. The elder Critchett (George) used to show scrofulous children in old Moorfields with setons behind their ears and said: "On this little string hangs all my reputation!" The reviewer saw it also here and there in the country, used by old physicians in Germany, but in all universities they were obsolete. Great was the reviewer's astonishment to see it so patronized by a first-class eye-surgeon in the largest ophthalmic hospital in the world.

The **subconjunctival injections** and those into the eyeball for detachment of the retina and almost every disease are still far from endorsed in all countries as a legitimate passport. Among the **derivatives**, the **leeches** continue to hold their honest reputation. They are rarer in general medicine than before, but in ophthalmology their excellent services can almost daily be verified: it is in acute, *i. e.*, the so-called rheumatic iritis; ever since Wm. MacKenzie, in Glasgow, published the remarkable observation how he treated an iritis-patient in bed, and instilled atropine into his inflamed eye, and later found his patient not at all improved, the pupil and the pain remained the same. Then he put to the temple 6 leeches, which he let suck until they fell off. When he then examined his patient again, he found the pain relieved, and the pupil enlarged, although there had no atropine been instilled. The reviewer has repeated MacKenzie's experiment with the same result, and he is convinced that the leeches put midway between ear and eye, as near together as possible, and letting them suck 2 hours, and when they fall off

early the bleeding may be maintained by absorbent dipped in hot water. Every thing, of course, must be scrupulously clean and aseptic. It is prudent to let the patient keep his bed next day, quiet and careful in his diet, minding the physiological fact that after abstraction of blood, the blood will flow to the part affected with greater force the next day.

Scarifications with a curved knife have some value in hyperæmic swollen conjunctivæ, especially at the retrotarsal folds, in different inflammations.

Vaso-constrictors and vaso-dilatators. This paragraph gives a very clear description of **Adrenaline** in all its useful services; and a sketch of **Dionine**. The latter is prescribed

℞	Pure dionine	0.50
	Aq. dest.	10.00

Instil 2 drops into the lower conjunctival cul-de-sac, once daily. Apply afterwards an enveloped warm compress.

For iritis prescribe:

℞	Pure dionine	0.25
	Atropin sulphate	0.05
	Aq. destill.	10.00

Chapter VI.: **Physical Agencies.** § 1. **Heat.** It is used moist or dry. (1) *Moist heat.* It has been used at all times to relieve pain and to absorb pus. The moist applications act chiefly on the anterior parts of the globe, particularly in keratitis with hypopyon.

Cold is applied in pledgets of gauze or absorbent cotton, cooled on a block of ice or immersed in cold water, placed on the closed eyelids, after they had been wrung so that they are moist but not dropping. They are changed when they get warm. Ice-bags, containing small pieces of ice, put on the swollen and hot lid. Another mode of refrigeration is the so-called Leiter's coil—a small packet of lead-tubes, large enough to cover the inflamed part; the cooling is produced by cold water flowing from a bucket, elevated several feet, and is received in another bucket on the floor. This mode has been fairly popular, also for other parts of the body, for instance in the initial stage of tympano-mastoiditis.

Cold is indicated chiefly in acute catarrhal or purulent conjunctivitis, those of infants and adults, the epidemic Egyptian ophthalmitis, also in burns, traumatism of the lids and the globe.

GOLDZIEHER recommends it in internal hemorrhages. It is evident that cold is contra-indicated by feeble and anæmic persons.

Electricity. Static electricity has only a limited employment in ophthalmic therapeutics, but the dynamic electricity batteries, engendered by chemical reactions, are popular.

Electrolysis is used for contraction of the lachrymal duct. Abadie, Terson, and Dor have used electricity,—very feeble currents, and the electrodes not farther than 2–3mm. Brocq, Chisolm, Pansier, and others have tried to destroy the roots of crooked eyelashes. All these three indications have not been satisfactory.

Electric light is frequently used and with good result. In order to have correct light, *i. e.*, that which reflects the background in the normal color, which is red-yellow, we have to put a thin glass plate, tinted faintly yellow-orange. The electric light is of great service in nuclear and above all in secondary cataract. Farther on is electric light of the apparatus by Rochon-Duvigneaud: the diagnosis of an intraocular neoplasm is easily established.

To determine the presence and the place of a foreign body can be well made out by the magnetometer of Gérard and by the sideroscopes of Asmus and Hirschberg. These two apparatus repose upon the same principle, which Dr. POOLEY, of New York, first made known, *viz.*: the deviation of the magnetic needle.

The **large magnet**, or **giant magnet**, introduced by Dr. O. HAAB, prof. Univ. of Zürich, which is more expedient and more useful than the small magnets. It has the advantage that in most cases the giant magnet draws the particle of iron into the posterior recess of the aqueous chamber, without the surgeon knowing where the iron splinter is located. The electrode, held the fragment a little above the centre of the posterior surface of the lens, draws the particle around the equator of the lens into the posterior recess where it shows its presence by a slight bulge. From there we try then to draw it through the pupil into the anterior chamber, into which a small perforation is made with the keratome. The electrode is then put to the little opening, and the spicule jumps to the electrode, where it is held as long as the current is kept up. In many cases it will remain in the posterior chamber, wherever you hold the magnet. This is rather better than the passage between the anterior lens-capsule and the iris, whereby rupture of the iris or the lens capsule may occur. Under local anæsthesia an incision with a keratome is made, right before

the bulge in the iris, parallel to the border of the cornea, through which a diminutive piece of iris is drawn out, and nipped with an iridectomy scissors. The chip will then fly to the electrode. It is a sight inferior only to a cataract operation on an old man, who, in five minutes has his sight restored, and without pain. There is a good deal of detail which we have to mind, for instance: if the incision runs obliquely from below upward, the electrode must be in the upper part, if at the lower part the foreign body cannot slip out. It is most important that the chip is not drawn into the ciliary body.

The determination of the location by the X-rays has now been advanced—by Sweet in Philadelphia, and Dixon in New York, and others abroad. When the location has been determined without an error, the small magnet has the ascendancy. A small incision is made into the albuginea next to the foreign body. Then a long or short electrode is introduced, the current is turned on, and in the successful cases the splinter is brought out sticking on the end of the electrode.

Protection of the eye from light. Scrini says: "For my part I have never seen a patient that felt not really relieved by smoked glasses." Every oculist will indorse this. Some patients prefer yellow, or rather yellow-smoked glasses (Fieuzal). This would explain itself by the fact that the yellow glass attenuates not only the luminous but also the thermic and chemical radiations.

He cites a case of a student whom he had treated with Panas. The student had, in consequence of overstraining his force, felt a rapid diminution of sight, almost to total blindness. Under treatment his sight improved progressively, but the optic disks remained discolored. Complaining of photophobia, Panas advised him to wear smoked spectacles, which he replaced soon by pure yellow glasses. "Grand was the relief and, in that way, the patient could terminate his studies."

In Chapter VIII. we obtain some of the history of the **Ocular Prosthesis**. We know the merits of their first makers, Boissonneau and his sons. This was about 50 years ago. That family almost monopolized this small but lucrative craft. Their motto was: "Nous écorchons les riches, mais nous épargnons les pauvres." (We fleece the rich, but we spare the poor.) After them there have been better artificial eyes—for instance, by Müller Bros., at Wiesbaden, with help from Snellen and Pagenstecher.

It is important that the artificial eye fits well on the stump and the orbit. It should be removed in the evening and carefully cleansed. The conjunctiva should be kept healthy, cleansing it with a lotion of boric acid and with a mild astringent if inflamed. The eyelashes and the edges of the lids should be scrupulously cleaned to avoid adenoblepharitis and its consequences. The artificial eye should be laid in a lotion of boric acid, washed with absorbent cotton every evening, and kept free from dust. The artificial eye will be corroded more and more with its use. If it has been worn 15 hours a day, it can scarcely be continued longer than a year. "This is the extreme limit."

In Chapter IX. the **Mechanic Agents** are described. First the **Occlusive Bandages : Metallic protective apparatus.**—Stephensen, Andrews, Meloy, Ring, Fuchs (with illustration), and Pagenstecher. Fuchs uses them over the bandage of his cataract patients. It consists of a wire-lattice surrounded by an upholstered ring, and is fastened by a bandage. Then he describes in detail the compressive and immobilizing bandage of DE GRAEFE and that of PANAS in the Hôtel Dieu. Both consist in careful padding out the depressions surrounding the eye, after cataract extraction, with absorbent cotton. PANAS began these bandages with a small bullet of sterilized cotton, which he put into the nasal depression, and laid small cotton compresses in the depression between the margin of the orbit and the elevation produced by the eyeball. This is held by flannel or cotton bands.

Tarsorrhaphy is another help to prevent the expulsion of the globe, chiefly in Basedow's protrusion, also protrusion by traumatism. The operation is simple: at the temporal corner of the palpebral fissure the lids are shortened 2 to 5mm by cutting off the skin of the free border at the upper and under lids, whereupon the denuded parts of the lids are stitched together (Tarsorrhaphy).

Massage has been practised by the African sorcerers, by the Chinese, the Indians, the Greeks, and the Romans. Hippocrates' teachings of it have been collected by Asclepiades, among others. Really the massotherapy of the eye has entered into the scientific road only the last few years. The simple massage gives good results on the subconjunctival and palpebral ecchymoses. The rapid resorption of exudations, under the influence of massage, explains its application in iritis. It is recommended by Mules, Domec, etc., for blocking of the central artery of the retina, as

the accelerations of the circulation might favor the displacement of the embolus. The author describes the **varieties of massage**, the **medicamentous**, the **traumatic**, the **instrumental** in trachoma.

Sutures are of great value in eye-surgery. They require to be handled with great care, especially in perforation of the sclerotic and lids. In laceration of the eyelids the traction of the muscles must be considered ; they tend to enlarge the opening, as the two divided parts draw now the gap asunder. It requires a suture that unites surely ; if the tarsus is lacerated with the skin and the orbicular muscle, the adaptation must be correct and firm, and there should be no gap at the free border which may cause laceration. The patient should be in bed and keep as quiet as a cataract patient.

The last paragraph deals, on two pages, on some **mechanical modes of treating trachoma**, the disease of which DE GRAEFE said that it was the second question in ophthalmology,—cataract being the first, in importance. The mechanical treatments are : As in inveterate cases of trachoma the topical remedies were found insufficient,—one turned to scarifications, to *brossage*, *râclage*, and *expression*.

Brossage and râclage. The patient has to be under general anæsthesia. The hard granules in the cicatricial tissue have to be removed by a curette. The same has been done for a long time at the St. Petersburg Ophthalmic Hospital, where it was introduced by the late Dr. SCHROEDER. The reviewer has seen the brossage in New York, where Dr. MARPLE, who had seen it in Paris, introduced it. The patient, under ether, had his inverted lids scarified in parallel lines, after that a metal brush passed more or less deep over the conjunctival surface, where the hard granules came out. A similar treatment, Dr. GEO. LINDSAY JOHNSON, of London, showed me, at least fifteen years ago. The results were good.

The **roller forceps** is not particularly for the treatment of the old hard, cicatricial cases, but for recent cases where there are any number of well developed, round granules. Its **principle is to remove the granules with preservation of the mucous membrane, i. e., the conjunctiva.** The reviewer, before he designed the roller, saw a pair of pincers, by Dr. Hy. D. Noyes, at the New York Eye and Ear Infirmary, a forceps

with two branches, with smooth and concave cross-pieces at the free ends of the branches. With this he squeezed the granules out. Several of these forceps with cross-pieces at the end have been made since, which pressed out the granules more or less. The reviewer, at once, made the cross-pieces cylindric and fluted. In order to spare the integrity of the conjunctiva, the cylinder was made fluted, so that during the rolling the prominent part of the membrane of the granule should burst and the contents be pressed out. This instrument is used almost every day, with undiminished satisfaction, but the number of children with acute trachoma is much less than several years ago, but to make amends, the chronic trachoma of the Orientals has greatly increased.

There are in Chapter X. Some General Treatments : The chief remedies for pathologic constitutions or acquired general diseases. Then a chapter on: Consultations on Some Frequent Eye Diseases. This gives the discussion to lead to the diagnosis and the treatment; the remedies are not only given the name of the chief drug, but the full formula, how to write it down, and how to give the direction to the nurse or the patient. This review, which the undersigned has read mostly with great care, will convince the reader that it is an excellent school-book, and different from most others of which one is copied from the other. The reviewer made the acquaintance of the author; he gives also courses in refraction, and all that ophthalmology contains.

Scrin's book describes so carefully the **modern remedies** not only short, but in extenso, the pharmacology and particularly the new features they have; the treatment in formulas, which the reader can try at once, also the use and effect on the patient are clearly and fully described. There should be soon a second edition, and this is worthy of being translated, because no book deals so extensively and clearly with the modern therapeutique.

H. KNAPP.

XII.—**Einführung in die Medicinische Optik** (Introduction into Medical Optics). Von Dr. A. GLEICHEN, Privatdocenten an der Berlinischen Technischen Hochschule, etc., in Berlin. Wilhelm Engelmann, Leipzig, 1904.

This book gives a thorough presentation of all that is necessary to understand and handle the higher chapters of physiological optics. Trigonometry and algebra are mostly used, so that a scholar who has gone through the mathematics taught in a good

German Gymnasium or an equivalent—a polytechnical school in any civilized country—will understand the book, and obtain sufficient knowledge to understand and teach refraction in all intricacies and combinations ; from the combined system of the normal eye, with its asymmetry (astigmatism) and its correction with cylindrical glasses, and further a variety of contrivances, instruments, and apparatus from the simple spectacle-glass to the complicated microscopical and astronomical instruments. A similar preparatory book is that of A. S. Percival¹—although it does not go so high. A friend of mine told me that there was no mathematical book to do justice to scientific ophthalmology of the present day. The book of Gleichen was up to the time, and he intends to translate it. He is a quick worker, and a scientifically educated man, but I do not know whether he is doing it.

H. K.

¹ *Optics, a Manual for Students*, 1899. Macmillan & Co., 10s. net.

ARCHIVES OF OPHTHALMOLOGY.

EPITHELIAL CYST FORMATION IN THE IRIS, WITH ILLUSTRATIVE CASES.¹

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(With eight figures on Text-plates IV.-VII.)

EPITHELIAL cells proliferating in the iris usually result in cyst-formation. They seldom, if ever, possess the attributes characteristic of malignancy. Nevertheless, a benign growth when situated in the anterior chamber may cause destruction of the eye. Parsons, in *The Pathology of the Eye*, classifies cysts of the iris as follows: (1) *Implantation cysts*, including pearl-cysts and atheromatous cysts; (2) *Retention cysts*; (3) *Congenital cysts*; (4) *Cysts of the retinal epithelium*; (5) *Parasitic cysts*. He further defines as complex cysts those in which "not only the iris but also the cornea and anterior chamber take part." Greeff regards as true cysts only those having an epithelial lining and fluid or semi-fluid contents. Clinically, the great majority of cysts that occur in the iris have walls consisting of an external layer of compressed iris tissue and an internal layer of epithelial cells. Under the name of *epithelial cysts* it is desirable for my present purpose to include in one group all non-congenital iris cysts in which epithelium forms a component part. This will include the first group of the above classification and such complex cysts as are lined with epithelium. The other varieties of iris cysts are very rare. As they differ in their etiology from the epithelial cysts the various theories regarding their origin will

¹ Received by the Editor in February, 1906.

not be considered here. Except the pigmented cells of the pars iridica retinae, the iris is a mesoblastic formation devoid of epithelium. Consequently, when an epithelial cyst develops in iris tissue, it is evident that the epithelium must have been introduced from without. The *method* of introduction is the subject to be discussed in the present paper.

Probably all true epithelial cysts of the iris are preceded by perforation of the cornea. Rothmund collected thirty-seven promiscuous cases of iris cysts in which he obtained clear histories of perforating wounds in 83.3 %. Very rarely cyst of the iris follows ulcer of the cornea, as in a case reported by Gonella. After the cornea has been opened by accident or design, how do the epithelial cells enter the eye? The most generally accepted explanation is that of Buhl and Rothmund, namely: in consequence of a perforating wound a fragment of surface epithelium is detached, carried into the eye, and implanted in the iris. These engrafted cells proliferate and in course of time form either solid epithelial tumors or epithelial-lined cysts with fluid contents. In support of this theory extensive experiments have been undertaken by Dooremaal and many others, who have demonstrated that epithelium can be implanted upon the iris. These experiments have established a widespread belief in the Buhl-Rothmund theory of cyst development as shown by Parsons's classification, in which all cysts of epithelial origin are designated *implantation* cysts. There can be no doubt that cysts may, and occasionally do, develop in this manner, particularly those which form around cilia or contain sebaceous matter. Nevertheless, I believe the implantation method of cyst development to be very exceptional! A far more reasonable theory has been advanced to explain the presence of epithelial cells in the anterior chamber. In 1885, Stölting published two cases of true epithelial cysts of the iris. Both were preceded by perforation of the cornea with incarceration of iris in the wounds. Careful microscopic examinations were made of the entire globes. From a study of these cases Stölting drew the important conclusion that the cells from which the cysts developed were not detached from the surface and implanted in the iris, but that the sur-

face epithelium, which always proliferates and fills a corneal wound, had spread beyond the wound to the incarcerated iris. Through union of the corneal wound, the cells which had extended to the iris were cut off from the surface cells. They, however, survived, and by their subsequent proliferation formed true cysts of the iris. In other words, the epithelium had reached the iris by a process of growth and *extension* from the surface. In order to appreciate how reasonable this explanation appears, it is necessary to briefly review the principal phenomena that occur in the repair of corneal wounds, especially noting the great activity manifested by the surface epithelium in corneal regeneration. Exhaustive studies have been made on the repair of corneal wounds. Rabbits have usually been employed in experimental work. The results obtained conform in essential points with the changes observed in human eyes removed for accident or disease. An uncomplicated, incised perforation of the cornea, accompanied by loss of aqueous, is shortly followed by closure of the wound and restoration of the anterior chamber. The closure is brought about by swelling and apposition of the central lamellæ of the cornea and the formation of a fibrinous exudate which plugs the wound. Although the central layers of the cornea swell, the external and internal layers retract, thereby causing both openings of the wound to gape. The wound tract is thus separated into two V-shaped clefts, one communicating with the anterior chamber, the other opening externally. Receipt of such an injury is immediately followed by active proliferation of the corneal epithelium, which spreads down into the external division of the wound, lining its sides and covering the fibrinous exudate which remains at the bottom. This proliferation of epithelium reaches its maximum in two or three hours and is usually completed by the end of the first day (Weinstein). The epithelium remains in the wound until pushed out by regenerated corneal tissue. The posterior division of the wound becomes filled with endothelium, and union takes place by a similar but much slower process than in the anterior division. Similar phenomena occur in loss of corneal tissue without perfora-

tion. Temporary repair is effected by the epithelial cells, which multiply in sufficient numbers to fill in and level every inequality or crevice that exists. The latter process is well illustrated by the following case.

CASE 1.—The eye had been severely burned with lime. Other injuries necessitated enucleation. The microscope showed destruction of the external three-fourths of the cornea over a large area. The resulting excavation was entirely filled in with epithelial cells resting upon a bed of granulation tissue.¹ (Fig. 1.) (*From the Pathological Laboratory of the Brooklyn Eye and Ear Hospital.*)

The presence of necrosis or purulent inflammation does not inhibit the proliferative energy of the epithelium as shown by the following case.

CASE 2.—The eye was lost through panophthalmitis following cataract extraction. The photograph (Fig. 2) shows the proximal corneal flap infiltrated with pus, nevertheless the surface of the gaping wound is covered with epithelium which has extended from the surface to Descemet's membrane.¹ (*From the Pathological Laboratory of the Manhattan Eye, Ear, and Throat Hospital.*)

If from any cause a corneal perforation remains open and no obstacle is presented to the progress of the ingrowing epithelium, the latter will not confine itself to the anterior division of the wound, but spread beyond to contiguous parts. Such migration of cells may be followed by various unfortunate results: the interposition of epithelium between the wound surfaces may delay union or permanently prevent cicatrization. In the latter case a corneal fistula will be established. The cells may extend to the iris or, as in the following case, line the anterior chamber.

CASE 3.—The patient was treated by my associate, Dr. Charles Burr. A perforating wound of the cornea was received eight

¹ As the cases reported in this paper are to illustrate only an argument, irrelevant details are omitted for the sake of brevity.

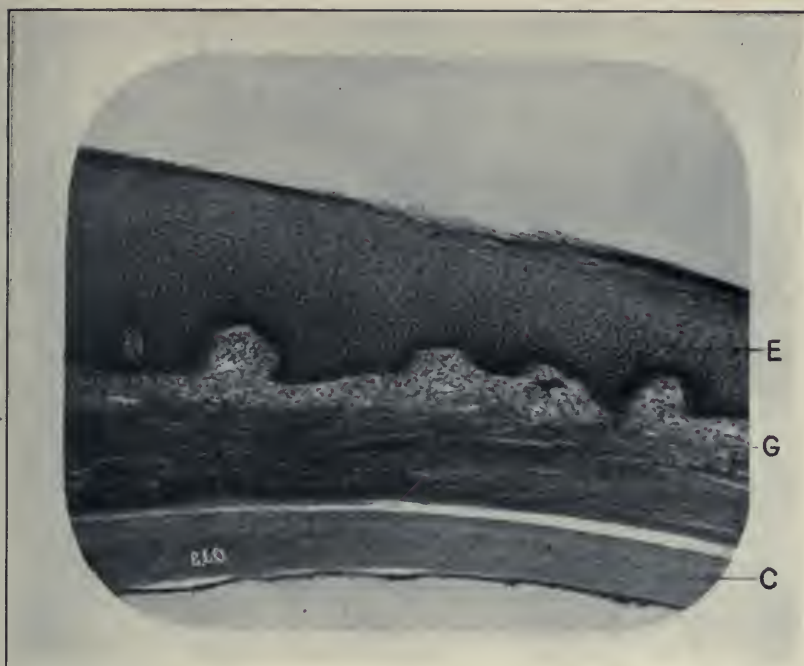


FIG. 1. Process of repair after loss of corneal tissue. Lime burn. C. Undestroyed posterior layers of cornea. G. Granulation tissue, the inner layers of which have organized into scar tissue. E. Thick layer of young epithelial cells. B. & L. Obj. 2/3. Oc. 1.



FIG. 2. Panophthalmitis following cataract extraction. Proximal flap of corneal wound infiltrated with pus. Surface epithelium has lined wound and extended to Descemet's membrane. B. & L. Obj. 2/3. Oc. 1.

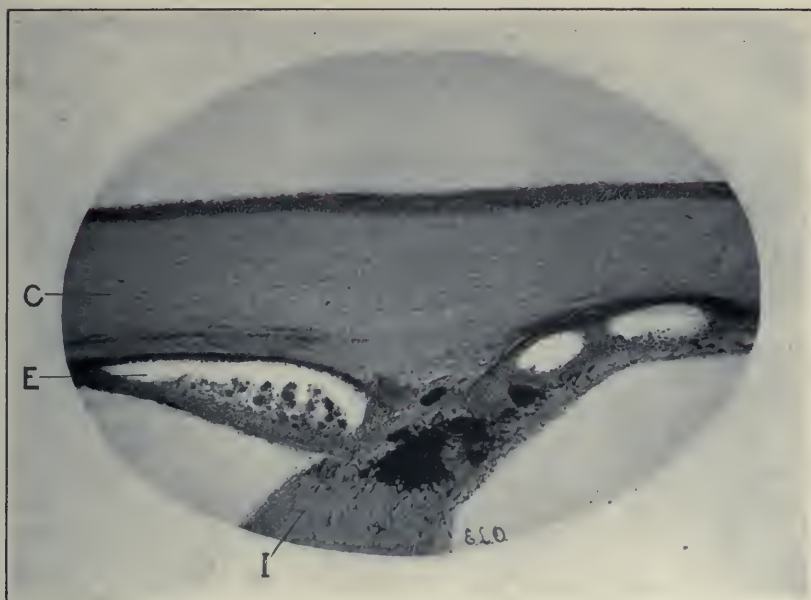


FIG. 3. Cystic and tubular spaces formed in iris and anterior chamber by proliferation of epithelium. C. Cornea. E. Epithelial cyst. I. Iris. B. & L. Obj. 2/3. Oc. 1½.



FIG. 4. Glaucoma produced by epithelium proliferating into filtration angle and obstructing outflow of aqueous from anterior chamber. S. Surface epithelium. C. Cornea. B. Ciliary body. E. Epithelium in filtration angle. B. & L. Obj. 2/3. Oc. 1.

years before enucleation. Some vision was retained for seven years, then inflammatory glaucoma developed and sight was entirely destroyed. At last the eye was enucleated to relieve the continued pain and inflammation. Microscopic examination showed anterior synechia and extensive growth of epithelium in the iris and anterior chamber. The epithelial cells were deposited in superimposed layers corresponding both in appearance and arrangement to the corneal epithelium. They had lined a large portion of the posterior surface of the cornea and also formed numerous tubular and cystic cavities in the iris and between the iris and cornea. (Fig. 3.) The immediate cause of glaucoma was an extension of the epithelial sheet into the angle of filtration, thus blocking the outflow of aqueous from the eye. (Fig. 4.) (*From the Laboratory of the Manhattan Eye, Ear, and Throat Hospital.*)

The course of events in this case may reasonably be stated as follows: perforation of the cornea followed by the usual proliferation of epithelium. Through some accident to the process of corneal regeneration no obstruction was presented to the ingress of epithelium, which intruded into the anterior chamber. Subsequent union of the corneal wound isolated these invading cells, which continued to proliferate until they destroyed the eye, as described above. Fuchs has seen four similar cases and suggests that "*this condition may sometimes be the cause of increased tension after cataract extraction.*"

Instead of spreading throughout the anterior chamber, the epithelium may be confined to spaces created by inflammatory adhesions between the iris and cornea, as illustrated by the following case.

CASE 4.—Male, aged twenty-four. Six years before coming under observation the cornea was perforated by a piece of steel. The foreign body was removed immediately, and prompt union of the wound followed. The eye had been painful for the past year. He exhibited dense leucoma of the cornea. No perception of light. As pain was persistent, the eye was enucleated. The pathological examination showed total anterior synechia except at one point behind the leucoma, where a closed cavity

existed between the iris and cornea. This space was lined with epithelial cells. (Fig. 5.) (*From the Pathological Laboratory of the Manhattan Eye, Ear, and Throat Hospital.*)

Should the iris obstruct a corneal wound, the ingrowing epithelium may penetrate into its spongy tissue and form a cyst. It is impossible to state the conditions that determine extension of epithelium to an incarcerated iris. When the iris lies at the bottom of a corneal perforation, its exposed surface is covered with a layer of fibrinous lymph which protects it from contact with the epithelium. (Fig. 6.) It may be assumed that should this lymph fail to form, or be lost after its formation, the iris would thereby be deprived of its natural protection against epithelial invasion.

Proliferating epithelium confined to iris tissue usually forms a cyst. This result is not wholly due to its confinement within a circumscribed space, as non-malignant, migrant epithelium appears to possess an inherent tendency towards cyst formation.

The following case is an example of the extension method of epithelial cyst formation in the iris. The patient was treated by my associate, Dr. J. L. Barnes.

CASE 5.—Woman, thirty-eight years of age. A perforating wound of the cornea was received in infancy. Some defect of the iris had been observed for many years. The eye had become blind and painful within the past year. There was a tumor in the anterior chamber in size and appearance resembling a dislocated lens. Iridectomy was performed, and an unsuccessful attempt made to remove the tumor. Its complete collapse during operation revealed its cystic character. Two weeks later the eye became hard and painful. It was then enucleated.

Pathological Examination.—In the anterior chamber are the remains of an iris cyst the walls of which are supported by iris, cornea, and lens. The cyst cavity is lined with from one to four layers of stratified epithelium. These cells are degenerated and stain but faintly with hematoxylin. Evidently the cyst developed in the stroma of the iris as a thin layer of pigment can be traced between the epithelium and surrounding tissues. The walls of the cyst were ruptured, but its removal by operation was prevented by firm and extensive adhesions to the cornea and

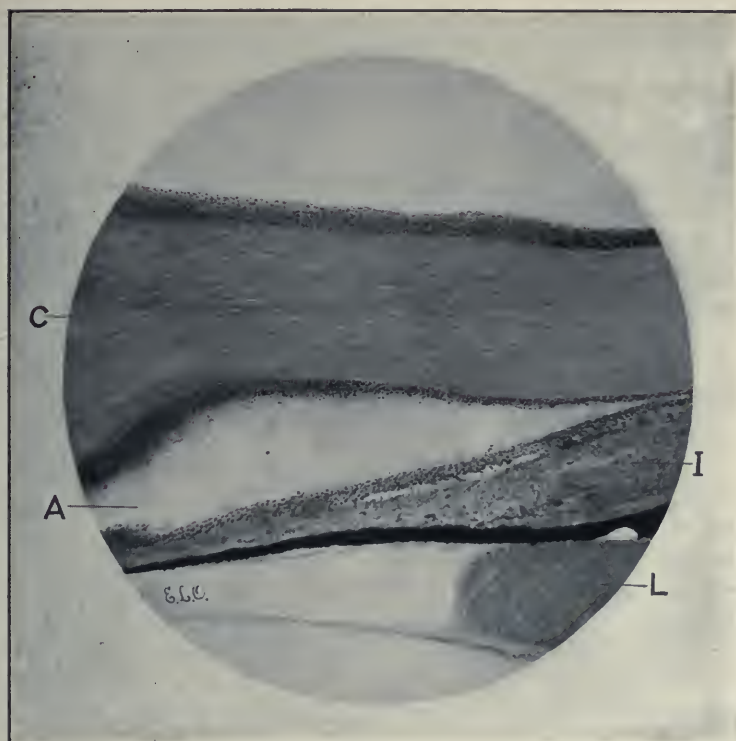


FIG. 5. Anterior chamber obliterated by inflammatory adhesions between iris and cornea except a cystic space (A) lined with epithelium. C. Cicatricial cornea. I. Iris. L. Lens matter. B. & L. Obj. $2/3$. Oc. $1\frac{1}{2}$.



FIG. 6. Perforating wound of rabbit's cornea, 48 hours old. Pro-lapse of iris. I. Incarcerated iris. F. Layer of fibrinous exudate. E. Layer of new epithelium. B. & L. Obj. $2/3$. Oc. $1\frac{1}{2}$.



FIG. 7. Iridectomy wound two weeks old. Prolapse of iris. Epithelium has invaded iris and formed cyst. S. Surface epithelium. C. Cornea. I. Iris. E. Epithelial cyst of iris. B. & L. Obj. $2/3$. Oc. 2.



FIG. 8. Epithelial cyst formation. Continuity of ingrowing epithelium has been severed by union of corneal wound isolating cells in iris. S. Surface epithelium. P. Corneal cicatrix marking line of perforation. E. Epithelial cyst in iris. I. Iris. B. & L. Obj. $2/3$. Oc. $3/4$.

lens. This cyst was the tumor observed clinically. I shall refer to it as the *old cyst*, to distinguish it from another and more interesting cyst formation in the same eye. At the site of the recent iridectomy the iris stump is incarcerated in the wound. The corneal epithelium has proliferated into the incision as usual. Here it has encountered and penetrated into the incarcerated iris, in the tissues of which it has formed a true cyst of the iris. The cyst thus created extends into the anterior chamber, its external wall resting against the posterior surface of the cornea. Serial sections demonstrated this to be a closed cavity. Fig. 7 shows a region where only superficial closure of the wound has taken place. Here the epithelium can be traced as a continuous unbroken sheet down through the track of the wound and into the cavity of the newly created cyst. Another section from the same cyst (Fig. 8) exhibits a region where cicatrization of the cornea is nearly completed. The continuity of the ingrowing epithelium is severed, thereby isolating the cells which have invaded the iris. The cells lining the cyst are stratified epithelium, from five to fourteen layers in thickness. They are vigorous young cells, which stain deeply as contrasted with those lining the old cyst. They tend to arrange themselves as on the cornea, the basal cells being cuboidal and the superficial flattened. Cellular segmentation exists throughout the basal layer, but is more active on the inner wall, where the epithelium is most abundant. There is no true basement membrane, the epithelium everywhere resting upon iris tissue.¹ (*From the Pathological Laboratory of the Manhattan Eye, Ear, and Throat Hospital.*)

The above cases demonstrate that after perforation of the cornea the surface epithelium will spread into the anterior chamber unless some obstruction is presented to its progress. In normal repair this accident is prevented by approximation of the wound-surfaces and formation of a fibrinous plug; but when overriding flaps or other complications create a patulous wound, epithelial invasion may follow. Therefore it is not unreasonable to believe that in epithelial cysts of the iris the epithelium first enters the eye by the process of *extension*. Experimental implantation of foreign

¹ This case was exhibited by the author before the Section on Ophthalmology, N. Y. Academy of Medicine, Jan. 18, 1904.

tissue upon the iris proves nothing except that the iris is good soil for epithelial growth. This fact counts as much for the extension as for the implantation theory. It also would lead us to expect the survival of epithelium which had extended to the iris. The extension theory necessitates contact between the iris and wound. That such contact does occur appears to be true, as the majority of published cases describe adhesion of either the iris or cyst wall to the cornea.¹

There is no proof that normal surface epithelium which has invaded the iris ever becomes malignant. In fact, it is doubtful if primary carcinoma of the iris has ever been observed. All cases reported as such have been discredited by more than one competent pathologist. The inflammatory changes excited by epithelial proliferation in the anterior chamber might produce a tissue closely resembling epithelioma.

Although Stölting's theory of cyst formation in the iris has been respectfully mentioned by writers, it has seldom been accorded the prominence to which it is entitled. One exception to this is a paper by Meller, in which he reported several cases of epithelial proliferation in the anterior chamber, and applied Stölting's theory to explain the phenomena. Another is a paper by Fuchs in which he states that "cysts of the iris occurring after penetrating wounds are always due to this form of intrusion of the external epithelium"; and again, in the last (tenth) edition of his text-book, he fully endorses the extension theory of cyst formation in the iris.

The propensity of corneal epithelium to penetrate into every accessible crevice has a very practical application in the treatment of corneal wounds, particularly cases of delayed union. It also emphasizes the well-known importance of securing accurate coaptation of flaps after operations involving corneal section.

¹ Accurate analysis of this point was undertaken, but found to be impracticable, as so many of the cases reported were clinical observations or incompletely described.

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CASE OF MELANOSARCOMA OF THE CHOROID AND ORBIT.¹

BY DR. EDWARD L. OATMAN, BROOKLYN,

SURGEON TO THE MANHATTAN EYE, EAR, AND THROAT HOSPITAL.

(With two figures on Text-plate VIII.)

THE patient, a married woman, fifty-six years of age, visited my clinic December 30, 1904. Nine months before this she accidentally discovered that her right eye was blind. Seven months after this discovery it first became painful. When she appeared at the clinic the eye was in a state of advanced glaucoma and violently inflamed. Pupil small; iris atrophic and inseparably bound to the lens; lens cataractous; no reflex from the fundus; no perception of light. The left eye was normal. This history of painless loss of vision followed by rapidly progressive glaucoma, accompanied by irido-cyclitis, with no evidence of disease in the fellow eye, indicated the presence of an intraocular growth. The patient was urged to have the eye enucleated at once, but would not then consent to operation. The glaucomatous inflammation steadily increased in severity and anterior staphyloma appeared. At last, January 11, 1905, she submitted to enucleation.

The essential features of the pathological examination were as follows: The cornea exhibited pannus degenerativus; the anterior zone of the sclera contained numerous round-celled deposits of inflammatory origin; over the ciliary body was an area where almost complete absorption of the sclera had resulted in staphyloma; this ectasia contained

¹ Received by the Editor May 24, 1906.

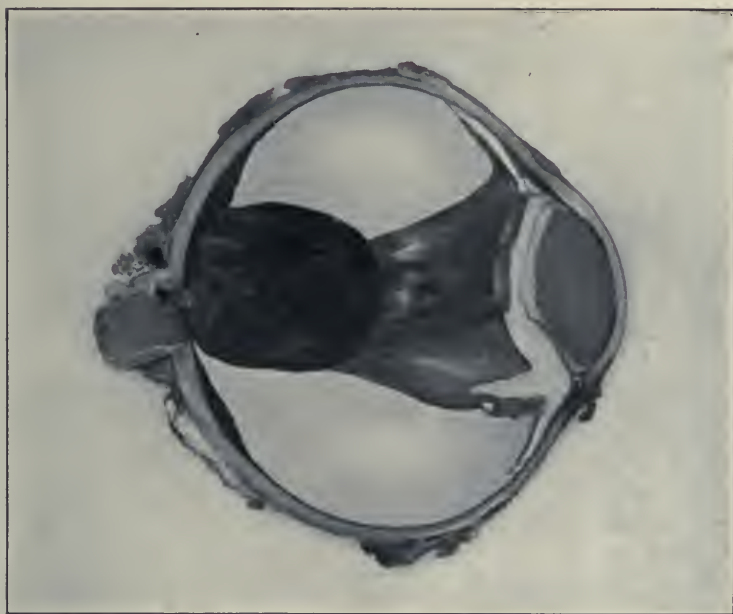


FIG. 1. Sarcoma of the choroid. The large spherical neoplasm is surrounded by a flat, circular, sarcomatous deposit.



FIG. 2. Showing extra-ocular sarcomatous deposits.

a portion of the ciliary body. The anterior chamber was represented by a thin line of coagulum; iris and ciliary body very atrophic; complete posterior synechia; lens cortex degenerated; retina totally detached. Springing from the choroid, close to the optic nerve, was a melanoma, spherical in form, measuring 10mm in diameter (Fig. 1). The tumor was surrounded by a flat, circular, sarcomatous infiltration of the choroid and suprachoroidæ 20mm in diameter. Two small extraocular deposits were found (Fig. 2). The first, spherical in form, 1mm in diameter, was situated within the sheaths of the optic nerve, in the angle formed by the junction of the nerve and sclera; the second, situated on the external surface of the sclera close to the optic nerve, had a long diameter of 2mm. Both nerve and sclera were invaded by these deposits. Histologically the neoplasm was a mixed round- and oval-celled sarcoma moderately pigmented. It contained numerous large, thin-walled blood channels. The operation wound healed kindly with the exception of an exuberant granulation over the site of the optic nerve, which recurred after removal. The existence of extraocular sarcomatous deposits rendered it certain that invasion of the orbital tissues had already taken place. On March 22d the orbital contents were removed. The periosteum was not disturbed because the secondary deposits were believed to be recent and limited to the neighborhood of the optic nerve. Microscopical examination of the tissues removed from the orbit revealed several sarcomatous deposits, composed of round and spindle cells, some of which were pigmented. A few isolated, pigmented, spindle cells were found in the lymph space surrounding the optic nerve. In order to afford the patient every possible chance to recover, she was placed under the care of Dr. Wm. J. Morton, at the Post-Graduate Hospital, where X-ray was applied to the orbit every other day for four months.

The object of this report is to assist us in our prognosis of cases in which sarcoma of the choroid has invaded the orbit. Extraocular extension of choroidal sarcoma is an occurrence of extreme gravity. If malignant elements have migrated

beyond the bony walls of the orbit, they probably are inaccessible to the surgeon. In such cases, operative interference appears to excite increased proliferative energy in the sarcomatous deposits. It is therefore of the utmost importance to operate while the morbid process is still confined to the orbital tissues. In the above case the extra-bulbar extension was along the course of the optic nerve. Migrating sarcoma cells were found in the intervaginal space surrounding the section of nerve removed at the second operation. As this space is in direct communication with the cerebral cavity, it was considered more than probable that tumor elements had already passed beyond the optic foramen. One year and a half has now passed since enucleation. So far she has manifested no symptoms of local recurrence or metastatic deposits. Although it is too soon to feel confident of her safety, it is probable that if further extension had taken place along the route of the optic nerve, cerebral symptoms would have indicated the fact before this time. All the extraocular deposits were small. The one situated within the sheaths of the optic nerve would have been discovered only with the microscope. Had they been overlooked, the patient's only chance for life would have disappeared.

TRAUMATIC LACERATION OF THE INFERIOR RECTUS MUSCLE.

By H. MOULTON, B.S., M.D., FORT SMITH, ARK.

Oct. 19, 1904, Mr. H—, aged fifty-seven, came to me stating that three weeks before, while riding, he was struck in the face by the limb of a tree and knocked from his horse, receiving a deep wound under the right eyeball, inside the lower lid. The face otherwise was merely bruised and scratched. In falling, the back of his head struck the ground and rendered him unconscious for some moments. At the time he came to me, his recovery had been complete, except that his right eye was turned upward, and he had double vision.

Status Præsens: The right eyeball is more protuberant than the left by 2mm. It deviates upward 30° and outward 10° as measured by the perimeter. In the middle of the lower *cul-de-sac* is a rough scar occupying two-thirds of the space between the two canthi. The appearance is as if the lower bulbar conjunctiva and underlying tissues had been stripped from the globe and pushed under it and had there cicatrized, thus deepening the *cul-de-sac* to about twice its usual depth. Voluntary downward rotation was impossible. Vision = $\frac{20}{80}$, although there were no lesions of the media or fundus.

Operation.—Jan. 30, 1905, four months after the accident, the scar was dissected free from all attachments and adhesions to the globe. The inferior rectus was found attached to the deeper portion of the scar tissue. A single suture armed with a needle at each end was employed to advance the tendon and overlying tissues after the manner employed by Beard in his advancement operation. Tenotomy of the superior rectus was then done and

the eye bandaged. The final result of the operation is that the patient has comfortable binocular single vision within an arc of 10° above and 10° below the horizontal plane, with vision of $\frac{5}{8}$ in each eye. The ptosis still remains.

It is interesting to note the improvement of vision in the eye after operation. Is it possible to account for the previous poor vision by the four months' disuse of the eye and that it was a case of commencing amblyopia ex anopsia?

Charles Stedman Bull, writing in Norris and Oliver's *System of Diseases of the Eye*, vol. iii., page 20, says: "The ocular muscles are sometimes injured without any accompanying luxation of the eyeball; but these accidents are very rare, not more than twelve or fifteen having been reported. The internal rectus is the most frequently injured." In the limited literature at my command I have been able to find twelve cases of traumatic laceration of the extrinsic ocular muscles reported by seven authors. The most frequently injured muscle was the superior rectus five times (which is in opposition to Bull's experience just quoted), the inferior rectus twice, the internal rectus four times, and the external rectus once.

In most of these cases the function of the muscle was restored by operation, but Fejér (1) reports a case in which the muscle became reunited to its proper position spontaneously, and hence concludes that it is not always necessary to suture the cut ends of the muscle in these cases. This, however, does not appeal to one as rational teaching. In my case, it is probable that a replacement of the muscle immediately after the injury would have given a better result than the late operation. Panas (3), after reporting three cases, relates his experiments on the cadaver and animals. He has never been able to tear a tendon from the eyeball but only to rupture the belly of the muscle; and concludes that in order that the tendon be torn the muscle must be in a state of tension. Dimmer (2) reports some cases in which, in addition to direct injury to an internus or inferior rectus, there was at the same time an indirect injury to the levator and superior rectus, probably due to the pressure of the eyeball upward against these muscles. With this exception the injuries were all direct, caused by some blunt or sharp object, as a piece of iron or wood or a cow's horn, etc., penetrating the orbit and thus reaching the muscle or its tendon.

The twelve cases of direct injury are reported as follows :

- 1 Fejér—*Arch. f. Augenheilk.*, xlviii., 264, one case.
- 2 Dimmer—*Zeitschr. f. Augenheilk.*, ix., 327, two cases.
- 3 Panas—*Arch. d'ophtal.*, xxii.-iv., 229, three cases.
- 4 McCachran—*Am. Jl. Oph.*, vii., 364, one case.
- 5 Viciano—*Arch. d'opht.*, 1889, No. 6, 508, three cases.
- 6 Vinsonhaler—*Annals of Ophthal.*, Apr., 1905, one case.
- 7 Kempner—*Klin. Monatsbl. f. Augenh.*, Feb., 1903, one case.

A CASE OF ORBITAL ENDOTHELIOMA.

RADICAL OPERATION AT THE NEW YORK OPHTHALMIC AND AURAL INSTITUTE, BY DR. HERMAN KNAPP. NO RECURRENCE AFTER TWENTY-SIX YEARS.

REPORTED BY DR. JAMES M. COOPER, OF DETROIT, MICH.,
HOUSE SURGEON.

ALTHOUGH the following case has been already mentioned several times in ophthalmic literature,¹ it has never before been published in full, and inasmuch as it presents several interesting and perhaps unusual features, the writer wishes to place it on record in order that it may be available to any one compiling statistics of orbital neoplasms. It is seldom that a case of this character can be kept under observation for a period of twenty-six years, and the opportunity thus afforded in the present instance is without doubt of considerable value. The patient, who has been in the habit of presenting himself for examination about once a year, was seen by the writer a few weeks ago, and it is from this examination, and from the records of the New York Ophthalmic and Aural Institute, and from a microscopical examination of the growth itself, which was found preserved in the laboratory, that this paper has been prepared. I am under obligations to Dr. Herman Knapp, who drew my attention to the case and asked me to search for the specimen and describe it for publication.

¹ Knapp, Discussion at American Ophthalmological Society. Ring, *N. Y. Medical Journal*, June 10, 1905.

The patient, A. S., aged twenty-four, was admitted to the hospital on March 30, 1880, presenting a new growth in the left orbit, and giving the following history: He first noticed trouble with his eye a year and a half previously, and refers the commencement of his disease to a particular date upon which he was struck in the eye by several cinders, which lodged in the conjunctiva of the lower lid, and one of which, patient is certain, was never removed. The eye was red and sore for a long time, and after some months the pain became more intense, being of a throbbing character, and situated in the globe, orbit, brow, and temple by turn. The tumor began to be palpable about six months before his admission to the hospital and was then located in the floor of the orbit. It rapidly increased in size, extending forward beneath the conjunctiva—pushing the globe upward and inward—and by attachments to it restricting its movements in all directions. Pain was now constant and of a dull, throbbing character.

Examination showed the presence of a firm tumor-mass beneath the skin, in the lower and outer part of the left orbit, displacing the globe and rendering it stationary by numerous adhesions. Palpation demonstrated the mass to be immovable, hard, and attached to the orbital walls, evidently extending far back into the orbit, but seeming—in its outer parts, at least—to be encapsulated and not to infiltrate the surrounding tissues. Vision O. D. $\frac{20}{20}$, latent hyperopia; O. S. $\frac{20}{00}$, not improved by lenses. Patient had not, however, noticed any diminution in visual acuteness; and states that he had been operated upon when a child for convergent squint, and that he had never been able to see well with the left eye. No murmur could be heard upon stethoscopic examination and the growth did not pulsate. The preauricular and cervical lymph-glands were not involved.

The family history was negative as regards the subject in question, and the patient himself was otherwise in perfect health.

Diagnosis of orbital sarcoma was made and enucleation of the growth advised. The operation was performed by Dr. Herman Knapp, and is described in the records as follows:

“An incision was made along the lower edge of the orbit, and the skin and subcutaneous tissues retracted until the tumor was exposed to view. When this was reached it was

detached above and on the sides from the surrounding tissues, it being encapsulated and well defined in these parts. At the lower and outer part of the globe the tumor and eyeball were adherent and had to be separated—the inferior oblique muscle, which was exposed, being spared. The growth extended far back into the orbit, but was easily detached above from the orbital tissues beyond the posterior surface of the globe. The firm attachment to the floor of the orbit required the use of scissors and chisel to break it up; but finally the periosteum was detached as far back as the growth extended. After cutting the posterior attachments, it was found that a portion of the optic nerve, one-half inch in length, had been removed with the growth, which had involved the sheath of the nerve. Before the main mass of the tumor had been removed, copious hemorrhage ensued in the depths of the orbit, probably from division of the ophthalmic artery. A few small pieces of the tumor on the sides and at the apex of the orbit were then removed, the whole being accomplished without injury to the globe. After the hemorrhage had been controlled the wound was united and a pressure bandage applied."

Contrary to expectations, the wound did not unite by first intention, but discharged freely both through wound and through an opening made in the conjunctiva below the eyeball. On account of the section of nerves and blood-vessels, the cornea was rendered insensible, and its nutrition interfered with. A large and deep corneal ulcer subsequently developed, which complicated the healing process and prolonged the patient's stay in the hospital. An interesting note of the fundus examination, made a week after the operation, is as follows: "Media clear. Retina milky white. Vessels appear as dark streaks. No cherry-red spot at macula, but otherwise the picture of retinal embolism." The corneal ulcer began to develop about two weeks after the operation, its acute stage lasting about two weeks. Patient was discharged May 3, 1880, thirty-four days after his admission.

He was next seen on June 6, 1880, at which time the following note was appended to the record: "Globe attached to scar; not movable. Corneal opacity clearing."

Since his recovery from the operation performed twenty-six years ago, patient has had no trouble in the way of pain, swelling, or inflammation in the globe or orbit. He has presented himself at intervals of from twelve to eighteen months for inspec-

tion, and there has never been at any time the slightest sign of a local or metastatic recurrence. He was examined by the writer in January, 1906, and the following conditions were found: Globe shrunken and hard. Immovable from attachments to orbital walls. The cornea is opaque; V = 0. He has never been able to wear an artificial eye with comfort, chiefly on account of the absolute immobility of the stump, which causes the conjunctival secretions to collect and harden in a horizontal line opposite the palpebral fissure.

After seeing the patient and referring to the hospital records in his case, a search was made for the tumor among the pathological specimens preserved in the laboratory. It was found, almost entire, in 80 % alcohol. The part containing the piece of optic nerve had been cut away, except for a small portion of its sheath, and could not be found. The part left, which comprised practically the whole tumor, was of a roughly pyramidal shape, about 50mm long and 20-30mm in diameter at its base. It was firm in consistence and sections are seen to contain numerous trabeculæ of connective tissue extending inward from a well-marked capsule above and on the inner and outer side. Below the capsule is absent. At one point the tumor mass appears on both sides of its capsule, and *in this extra-capsular portion of the growth is found its most typical structure, this being an area of active proliferation. Sections were cut from several parts of the growth in such a manner as to include the capsule and tumor mass to its centre. The extra-capsular portion was sectioned by itself.*

In this extra-capsular part are found masses and clumps of large oval cells, with large faintly staining nucleoli lying loosely packed in spaces and clefts of newly formed connective tissue. In the trabeculæ of connective tissue are numerous small blood-vessels consisting only of a single layer of endothelial cells. Blood cells are also found in spaces of the tissue which have no recognizable endothelial lining. Karyokinetic figures are occasionally recognizable.

Other (intracapsular) portions of the tumor mass show such a variety of structure that, if only single sections from

various localities were considered, a variety of diagnoses would result. In general, the cells are more densely crowded together and the trabeculæ of connective tissue either pushed aside or covered over, *the tumor appearing as a round-cell sarcoma. In still other places the cells take on a spindle shape*, being held together by a fine hyaline intercellular substance. In these portions all traces of lymph spaces are lost, and even the blood-vessels have normally thick walls. No pigment is found in any portion of the tumor.

The capsule consists, for the most part, of dense hyaline tissue having few nuclei and blood-vessels. In portions of the growth which came from the apex of the orbit numerous corpora amylacea are found, but no other trace of nerve tissue is present. These are situated mainly along the course of a large trabecula of connective tissue extending into the growth,—and also in the neighboring capsule.

From the foregoing description, it appears that the cells—especially in the spreading portion of the growth—are distinctly endothelial in type, and the tumor itself may be regarded as primarily a proliferation of the endothelial cells of the orbital lymph vessels or capillaries. In the older and denser portions, the picture is that of a round- or spindle-cell sarcoma; and indeed it is not impossible that such areas represent a transition process into such a growth.

In comparing the tumor with endotheliomata found in other parts of the body, the absence in the present case of a tendency to colloid, hyaline, or myxomatous degeneration is striking. The corpora amylacea mentioned as being found near the apex of the growth may have come from the sheath of the optic nerve, of which they are an occasional, if not a normal, constituent. The fact that the radical operation completely eliminated the growth, confirms the frequently mentioned observation that orbital endotheliomata, while locally malignant, do not tend to form metastases, and that their complete removal may be confidently expected to result in a cure.

GLIOMA OF THE RETINA. REPORTS OF FOUR CASES.

BY DR. S. C. AYRES, CINCINNATI, O.

(With two illustrations on copper-plate.)

CASE 1.—Female, two and one-half years of age. Was first seen March 3, 1892. The child had a neoplasm in the left eye, which was discovered only recently. It presented a rounded appearance and was located in the upper and posterior portion of the globe. It was slightly vascular but did not present the typical appearance of a glioma. In order to clear up the diagnosis, I allowed the father to take the girl home for a few weeks. He returned about six weeks later in April, and there was noticed a decided change in its appearance. The tumor had advanced to the cornea and now quite filled the globe. It also had the characteristic yellowish reflex. Immediate enucleation was recommended and done. The microscopic examination of the eye revealed a glioma in the active stage of advancement.

In the *Transactions of the American Medical Association*, for 1902, Dr. C. R. Holmes reported this case, together with some others, as he was a consultant in the case.

CASE 2.—Female, twenty-two months, was first examined May 19, 1898. The left eye was blind and had been so probably for several months. Inspection revealed a neoplasm growing from the fundus and coming forward to the lens. It was yellowish in color and had developed in irregular masses. The pupil was dilated and the corneal diameter was slightly above normal. Tension was $+1$, but there was no evidence that the eye had ever been painful. The ophthalmoscopic appearance was so characteristic that immediate enucleation was advised and the operation done at once. The tumor was examined microscopi-

cally and found to be a glioma, the characteristic growth and development being present. I have seen the patient at intervals since then, and the last time was November 3, 1905. There has been no return of the growth in the orbit, and she wears an artificial eye and has done so for two years. It is now about eight years since the excision of the eye and the girl is in excellent health.

CASE 3.—Female, two and one-half years old. Was examined February 5, 1900. The right eye was nearly filled with a tumor which presented all the characteristics of a glioma. It came forward almost in contact with the lens; in the outer side it is lobulated, and its surface is vascular. The pupil is dilated, tension + 1, and iris discolored. Immediate enucleation was recommended and done very promptly at the child's home. The father wrote me recently that the child died about two weeks after the enucleation. She had a spasm and became unconscious. This points directly to an extension into the brain. I am unable to get any record of the microscopic examination of the eye, but the macroscopic appearance and the early death lead me to conclude that it must have been a glioma.

CASE 4.—Female, twenty months old. Was referred to me by Dr. J. A. Thompson. The child was well grown and presented a healthy appearance. About eight months ago, a peculiar reflex was noticed from the left eye. It did not excite any alarm at first, but as it continued to increase, an oculist in Chicago was consulted, who made a correct diagnosis. When I first saw her, October 3, 1905, the ophthalmoscope revealed a tumor on the inner side of the globe, which extended forward almost to the lens. It was rather flat and broad and presented the typical color of a glioma, but was not very vascular. A red reflex could be seen on the temporal side of the globe. The tension was normal, the pupil responsive, and iris not discolored. Enucleation was done at once. It is now two and one-half years since the operation. She is in excellent health, is growing and developing normally. There has been no return of the growth up to the present time.

Section of the globe shows a round, grayish-white tumor-mass, filling the posterior half of the eye. Its anterior surface projects to within 3mm of the posterior surface of the lens. The cornea, anterior chamber, iris, and lens present no pathological conditions, and the iris angle appears normal. Microscopically it

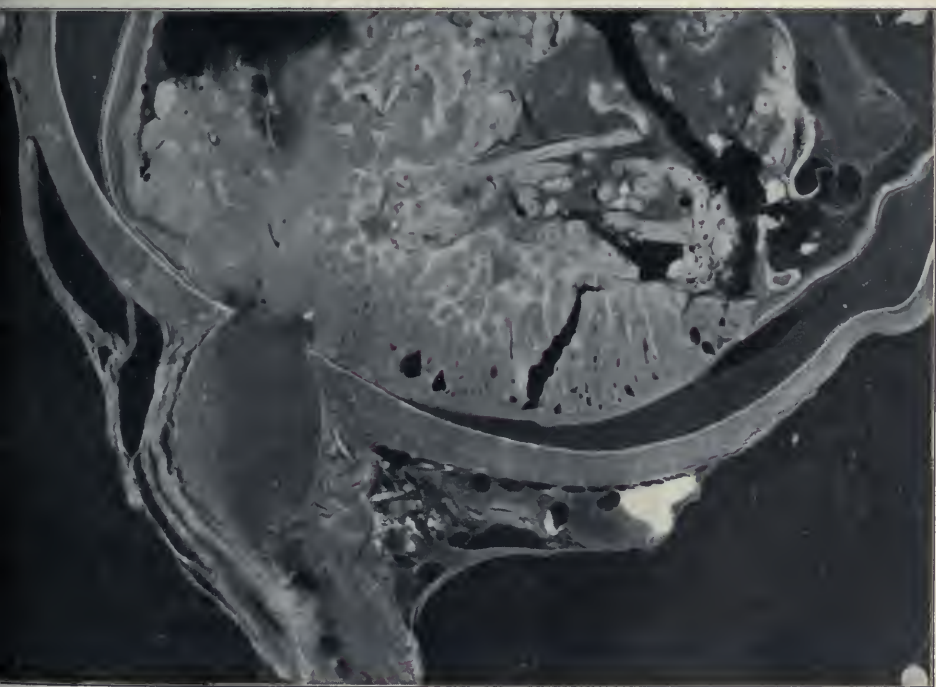
ILLUSTRATING A CASE OF ORBITAL ENDOTHELIOMA.



Endothelioma of orbit in transition into sarcoma. Removed radically by Dr. H. Knapp, twenty-six years ago. No relapse at any time. Patient has been well.



CASE NO. II ILLUSTRATION NO. 1



CASE NO. IV. ILLUSTRATION NO. 2.

presents a well-marked tubular appearance. Owing to the early removal, the subretinal space is entirely uninvolved, and there are very few areas of degeneration. There is an intense neuritis, the disk projecting out into the tumor. Marked congestion is observed and infiltration by glioma and leucocytes throughout the nerve as far as can be seen, infiltration being specially marked at a point just within the ora serrata, where the mass of glioma cells is so dense it might be considered a new focus. From sections made, its apparent origin is from the inner granular layer.

Of these four cases, two were two and one-half years of age, one was one year and ten months, and one one year and eight months of age.

Mr. C. Devereux Marshall states that the statistics of the Moorfields Hospital show that about 60 % of the cases of glioma occur in the first two years of life, and that about 80 % occur during the first three years. This coincides very nearly with the observation of Wintersteiner, who collected the large number of 467 cases, and found that 75 % occurred within the first three years.

With regard to sex, it is rather a coincidence that my cases were all females. In general the disease is about equally divided between the sexes.

Case No. 1 is now fourteen years of age and in good health.

Case No. 2 is now eight years of age and in excellent health.

Case No. 4 is now two and one-half years old, and bids fair to pass the three years' limit of immunity. A letter received from the father says "she is perfectly well."

Mr. E. Treacher Collins, in volume xiii., R. L. O. R., reviews the results in sixty-six cases of glioma of the retina, occurring in sixty patients. After giving the sex and age of the patients, he refers to the number of recoveries. Only those are considered to have recovered who have had no return of the disease for a period of three years. Among the cases above considered, which were operated on in the Moorfields Hospital during the years from 1871 to 1890,

there were eight recoveries. The time which had elapsed since operation varied from three years to nineteen.

Six more cases were known to be alive, but as they had not reached the three years' limit they are not considered.

Mr. Collins also appends a list of twenty-five successful cases occurring in the hands of various oculists, among them Brudinell Carter, Hirschberg, Knapp, Agnew, Lawson, Noyes, Lukowicz, and others.

In vol. xiv. *R. L. O. R.*, Mr. C. Devereux Marshall continues the report of Mr. Collins on the subject of glioma occurring from 1890 to 1897. There were 32 cases: of these there were 15 which had exceeded the 3-year limit, the time running from 3 years and 4 months to 6 years and 9 months. These cases include five cases where both eyes were removed. In the first series reported there were two cases of recovery after double enucleation.

In studying the statistics of 467 cases as described by Wintersteiner, we find that about 49 % occur in the first two years of life; 67 % in the first three years—these include the congenital cases, which constitute about 7 % of the entire number. It is possible that the congenital cases are more numerous than these statistics show. A baby's eyes are not closely inspected, providing there is no external evidence of inflammation. The neoplasm grows until it produces a reflex which is noticeable, and by this time it may have been developing for a few months. It is a curious thing that in some cases a visiting neighbor is the first to detect the defect. She comes in and inspects the baby critically, and of course takes it to the light where the reflex is seen for the first time.

An ophthalmoscopic examination is the only thing which would reveal the earliest stages.

ON PIGMENTATION OF THE RETINA AFTER OPTICO-CILIARY NEURECTOMY IN MAN.

BY DR. THEODOR F. STUDER,

ASSISTANT IN THE BERNE UNIVERSITY EYE CLINIC.

Abridged Translation from the German Edition, Vol. LIII., 1905 by

Dr. WARD A. HOLDEN.

(*With eight appended plates.*)

WAGENMANN'S paper, "Experimental Investigations on the Influence of the Retinal and Choroidal Circulation on the Nutrition of the Eye and the Results of Section of the Optic Nerve," *Graefe's Arch.*, 36, 1, contained the first systematic and methodical study of the cause of the changes in the pigment epithelium of the retina and the proof of the dependence of the epithelial changes upon morbid changes in the pigment epithelium.

Wagenmann's investigations concerned the rabbit's eye alone, and it is interesting to show by the examination of human eyes that his results have general applicability. Through the kindness of Prof. Siegrist I had the opportunity of examining an eye enucleated three weeks after an optico-ciliary neurectomy.

Elise B., aged twenty-four, had a miscarriage after a fall in the autumn of 1898. Ten days later the vision of the right eye became cloudy. In the middle of July she came to the clinic with a uveitic cataract in the right eye, with good projection of light.

In October a posterior cortical cataract had developed in the left eye.

February 22, 1899, an extraction with iridectomy was made in the right eye. Later the cataract in the left eye was extracted. The left remained free from irritation, but the right later became painful with swelling of the iris and high tension. Repeated attacks of glaucoma followed in the right eye and on February 3, 1900, optico-ciliary neurectomy was done. A vertical cut was made in the conjunctiva near the attachment of the external rectus. The muscle was fixed in a double hook and divided some millimetres from the ball. The optic nerve was then cut with scissors and the eyeball fully everted and all the ciliary vessels divided. After checking the hemorrhage, the external rectus was sutured and the conjunctival wound closed.

After the operation there were some exophthalmos and chemosis of the conjunctiva, a defect in the corneal epithelium where it was exposed by the incomplete closure of the lids, hypopyon, and cloudiness of the lower portion of the cornea; + T. The hypopyon became absorbed, but hemorrhage took place into the anterior chamber. The pain returned and on February 24th the eye was enucleated.

The ball was fixed in formol, imbedded in celloidin, and cut from above downward in serial sections.

ANATOMICAL EXAMINATION.

Conjunctiva.—Marked swelling of the bulbar conjunctiva, dilatation of the episcleral vessels, and exudation of leucocytes, many of them collected in groups and some breaking through the epithelium.

Cornea.—Almost normal conditions were found in the upper fourth of the cornea. In the centre of the cornea, epithelium and Bowman's membranes were wanting. On the temporal side the root of the iris was adherent to the cornea. In the stroma of the cornea there is an increase in the corneal corpuscles, more marked in the centre of the cornea, while near the limbus there is an infiltration with round cells and many new vessels are present.

The anterior chamber below contains great numbers of red blood corpuscles and some pus cells, lying mostly upon the posterior surface of the cornea where the endothelium is in part absent and in part increased by proliferation. In the

lowest portion of the cornea, the closely adherent hypopyon appears to have broken through Descemet's membrane and to have spread out diffusely in the stroma of the cornea.

Sclera.—In the nasal side of the sclera there is a moderate round-celled infiltration, and in the temporal side, near the attachment of the divided external rectus, there is some granulation tissue.

Ciliary Body, Iris, and Angle of the Anterior Chamber (Fig. 1).—The ciliary body, with its processes, is very much atrophied, measuring at the most one-quarter of its normal thickness, and is pressed forward toward the deep anterior chamber. The depth in the chamber is 3.5mm. Of the ciliary muscle only some flattened meridional fibres are to be distinguished, while the remainder of the ciliary body is closely infiltrated with round cells.

The iris is somewhat atrophic and infiltrated with round cells, particularly at its pupillary and ciliary margins. At the pupillary margin a cellular scar tissue unites the iris with the underlying remains of the lens capsule, within which are some cortical masses.

The root of the iris is adherent to the cornea for a short distance on the temporal side, blocking the ligamentum pectinatum and the passages to the canal of Schlemm, which is dilated and filled with blood.

On the nasal side, the iris in its ciliary half, which is thin and atrophied, is adherent to the posterior surface of the cornea. In the new-formed angle of the anterior chamber is blood, which extends in a thin layer over almost the entire anterior surface of the iris.

Similar conditions are found in the entire series of sections through the iris. Upward is a coloboma, but the channels of exit, toward Schlemm's canal, had not been opened by the iridectomy.

Retina and Choroid (Fig. 2).—A deep excavation in the disk is filled with blood. The retina and choroid immediately about the disk are completely atrophied. When examined superficially the retina and choroid in the nasal half of the eye appear normal, but marked changes are seen in the temporal half (upper portion of Fig. 2).

The nasal half of the retina has an average thickness of $0.168mm$. The different layers can be clearly distinguished and, excepting for slight changes in the pigment epithelium, diminution in the number of rods and cones, and replacing of the ganglion cells and nerve fibres by hypertrophied supporting tissue, the retina as a whole is normal. But there are a few small areas (one is shown in Fig. 3) in which the retina is thinned and its layers are unrecognizable. The composition of these areas is a dense fibrous tissue in which Müller's supporting fibres are still present and a number of spindle cells run in the plane of the retina. The marked feature of these $1-2mm$ areas is the presence of proliferated pigment epithelium extending through the entire thickness of the degenerated retina.

The larger arteries have sclerosed walls and the small twigs have disappeared.

The choroid is somewhat thinned on the nasal side, measuring on an average $0.018-0.02mm$. It is characterized by its great richness in long, spindle-shaped pigment cells. Besides these its component cells are long, rod-shaped cells surrounding the larger vessels which are not distended. The lamina vitrea is preserved, but there is only an indication of the choriocapillaris here and there. No inflammatory changes are present. Toward the disk the choroid is thicker and the vessels are more numerous and are also hyperæmic, and the choriocapillaris is better developed.

The portions of the choroid adjacent to the areas of pigmented retina show either a complete absence of vessels, being composed exclusively of spindle cells with infiltration of leucocytes, or there are hyperæmic vessels present.

As stated before, the most marked and extensive changes are found in the choroid and retina of the temporal half of the ball (Fig. 2 above). The thickness of the retina is reduced to $0.048-0.06mm$, and its characteristic structure is entirely gone. It is composed entirely of an almost homogeneous connective tissue with some fibres running in the plane of the retina. In this tissue there are many cavities and scattered round and ellipsoid nuclei. Leucocytes, are

not present. The limitans interna is intact. The striking feature is the intense pigmentation of the entire temporal portion of the retina.

Several degrees of development can be distinguished in this proliferation of pigment cells. In Fig. 4 masses of pigment are seen on the lamina vitrea four to eight times the size of normal pigment epithelial cells. These are arranged like the pigment epithelial cells, but there are breaks in the row. At other points (Fig. 5) there are clefts between the choroid and retina in which are rows of cubical or globular cells detached from their natural base, the lamina vitrea. At still other points (Fig. 6) the pigment masses are arranged in several layers between the choroid and retina. In the greater part of the temporal half of the retina, however, these pigment masses of irregular form and inconstant arrangement (Fig. 7) have wandered into the completely atrophic retina, and besides these large masses are small free groups of fuchsin bodies of granular or rod-shaped form. No leucocytes are present.

Within each pigment mass a nucleus was always present, though often this could not be seen until partial depigmentation of the section had been obtained by Alfieri's method.

The choroid in its temporal half exhibits hyperæmia of the vessels and considerable thickening. On an average it measures 0.052–0.066mm, but at some points it is greatly reduced. Besides the hyperæmia and thickening of the choroid there are extensive extravasations of blood. Thus in Figs 5, 6, and 8 almost the entire substance of the choroid is seen to be occupied with discolored and compressed red corpuscles. Here and there, however, the choroid is almost free from vessels and is composed of spindle cells.

It is worthy of note that at certain points in the choroid, and particularly where the extravasations of blood are most pronounced, large masses of pigment similar to those in the retina are found in the stroma of the choroid.

Vitreous.—The vitreous exhibits no particular changes, but at the posterior pole of the eye it is separated from the retina by a layer of blood 1mm thick.

EPICRITICAL REMARKS.

The clinical history and the anatomical examination show that this case was one of chronic iridocyclitis, which had led to nutritive disturbances in the lens and later to glaucoma. The glaucoma can be explained by the adhesion between the root of the iris and the cornea, which blocked the channels of exit from the anterior chamber.

The continuance of the increased tension after the iridectomy is explained by the facts, first, that the root of the iris was adherent to the cornea and could not be entirely removed, and, second, that portions of the capsule of the lens, including proliferated capsular epithelium, became adherent to the stump of the iris (Fig. 1), and thus the channels of exit from the anterior chamber became more completely blocked than before.

The evidences of a progressive glaucoma which did not yield to the use of myotics led to optico-ciliary resection, which three weeks later had to be followed by enucleation.

The corneal changes with the hyphæma and the hypopyon were due in part to the iridocyclitis and in part to the mechanical lesions occurring during or after the resection.

One cannot say with certainty how much the corneal changes were due to the division of all the posterior ciliary vessels, but in other cases that have been studied no corneal changes followed the operation. The fact that in our case many more leucocytes had wandered from the nasal limbus into the parenchyma of the cornea than from the temporal is explained, not so much by the division of the posterior ciliary vessels as by the simultaneous division of the anterior ciliary vessels on the temporal side, so that the source of leucocytes was on this side cut off.

On and about the sclera to the outer side of the ball is a vascular tissue with epithelioid and many giant cells not of a tuberculous nature.

Also about the divided optic nerve at the posterior pole of the eye there is a dense vascular granulation tissue as a result of the operative procedure. The disk itself is deeply excavated.

In the following paragraphs attention will be directed entirely to the changes in the retina and choroid.

Fig. 2 shows how the retina on the temporal side has become thinned, and has lost its characteristic structure and has been invaded with pigment cells, while the nasal (lower in the figure) half has undergone slight changes and has retained its normal thickness. The choroid also differs in its two halves. In the nasal half the choriocapillaris is wanting in places and some larger vessels are hyperæmic, but the choroid here retains nearly its normal thickness. In the temporal half, however, there is marked hyperæmia of the larger vessels, and at many points extensive extravasations of blood, so that on the whole it is considerably thickened.

At some points in the temporal half the choroidal vessels are completely wanting, and the normal structure is replaced by a mass of spindle cells with oval nuclei.

The microscopic picture presented by the choroid and retina in the temporal half of the ball has much similarity with the pictures which Wagenmann, Capauner, Leber, von Hippel, and Krückmann have found after division of the ciliary vessels or after the introduction of metallic splinters into the interior of the ball. The question arises: How are we to explain the peculiar changes in the temporal half of the retina?

Since before the operation pigment changes were not ophthalmoscopically visible and three weeks later appeared in the microscopic picture, it seemed warrantable to attribute these changes to the operative procedure. In resecting the optic nerve the central vessels of the retina and all the posterior ciliary vessels were cut, including the long ciliary arteries. Interruption of the circulation in the central artery of the retina leads only to sclerosis of the retinal vessels and degeneration of the nerve-fibre and ganglion-cell layers. After section or simple atrophy of the optic nerve the same results are observed: the pigment epithelium remains normal and pigmentation of the retina never occurs (Wagenmann,²⁰ Hertel⁹). When both the optic nerve and the central vessels are cut, the same changes occur in the retina,

but the degeneration is more rapid. No immigration of pigment is found here. The same results were obtained by Schechmann¹⁶ in dogs.

Berlin² and numerous others, among them recently Colucci,⁵ have described cases of division of the optic nerve followed by the immigration of pigment into the retina, but Wagenmann and Hertel have proved conclusively that in these cases there was not simple division of the optic nerve alone, but of a number of the posterior ciliary vessels as well. The cause of the atrophy of the retina and the migration of pigment into it in our case must thus have been due to division of the posterior ciliary vessels.

As was said before, Wagenmann²⁰ was the first to study systematically and methodically the results of cutting the ciliary vessels alone, and in his paper will be found a critical *résumé* of the literature. After cutting the ciliary vessels alone he noticed a grayish cloudiness of the retina near the divided vessels, which passed off in five days, when a fine punctate pigmentation of the retina could be seen that gradually became more marked. The pigmentary changes were found exclusively in the sharply circumscribed portions of the retina that had been cloudy, corresponding to the divided ciliary arteries. The retinal vessels were of nearly normal calibre. The altered portions remained anæmic, as subsequent injections showed, the circulation being re-established only after the third day, and some regions still remaining bloodless.

Microscopic examination showed first a serous infiltration of the retina, most marked in the outer nuclear and rod-and-cone layers. The individual elements were smaller, and between the rods and cones and the pigment epithelium lay amorphous albuminous masses.

The pigment epithelial cells were in the beginning but little altered, some cells being detached and of irregular form. Many free pigment granules lay outside of the cells. In albino animals Wagenmann often found that at this stage the pigment cells were degenerating, since their nuclei no longer took the stain.

The inner layers of the retina also early showed altera-

tions, such as spreading apart of the elements of the inner nuclear layer, broadening and clouding of the inner reticular layer, and atrophy of the nervous elements.

The degeneration did not advance uniformly, for in the portions in which circulation in the choroid was restored the degeneration of the retina was checked.

Over the portions of the choroid most markedly affected one saw, two days after the operation, destruction of the rods and cones and loosening of the pigment epithelium.

Corresponding to the most extensively injured portions of the choroid, one saw, two days after the operation, destruction of the rods and cones, loosening of the pigment epithelium, granular degeneration of the outer nuclear layer, destruction of the inner nuclear layer, and shrinking or absence of the ganglion cells.

Six days after the operation, Wagenmann found the retina in the affected areas very much thinned and much pigment present in the retina, partly within cells and partly free.

When the optic nerve and central vessels, together with the ciliary vessels, were cut in one orbit, there was a rapid destruction of the retina, while with simple section of the optic nerve in the other orbit, a slow degeneration of the retina took place.

Capauner⁴ also followed the development of retinal pigmentation in animal experiments. He divided the ophthalmic artery of the frog, and one long and some short ciliary arteries in the rabbit, and found that in a short time pigmented cells were present in the degenerated retina.

The fact that in our case there were only isolated foci of retinal degeneration in the nasal half of the retina and uniform degeneration of the entire temporal half of the retina, is perhaps to be explained by supposing that degeneration in the nasal half was prevented by the anastomosing anterior ciliary arteries in the nasal side, while the anterior arteries on the temporal side were interfered with by the tenotomy of the external rectus.

Anatomical examination of human eyes in which some weeks before enucleation optico-ciliary resection had been

done, has rarely been made, and no case exactly like our own has been found in the literature at our disposal. But the ophthalmoscopic changes have been studied in a number of cases in which resection has been done for tumors behind the eyeball. Schlodtmann¹⁷ in his monograph reports three cases from von Hippel's clinic, gives a *résumé* of the literature, and discusses the fundus changes.

His cases are as follows:

CASE 1.—Optic-nerve tumor removed after tenotomy of the internal rectus. Ophthalmoscopic changes seven months later. "Media clear; disk white and sharply outlined; all vessels narrowed, arteries more than veins, and their walls thickened; pulsation of the arteries when pressure is made upon the ball. In the macular region a previously existing exudation has given place to a group of pigment spots. Upward and inward from the disk there is irregular pigmentation of the fundus."

CASE 2.—Optic-nerve tumor. Tenotomy of internal rectus; ophthalmoscopic changes six weeks later. "Disk grayish-white and cloudy. On the lower half of the disk (inverted image) there is a thin deposition of connective tissue which sends several radial processes a short distance out into the retina. This new tissue conceals the origin of the vessels running downward. The veins are large and tortuous and the main trunks have thickened walls. The arteries are very small and their walls are thickened. Pressure upon the ball does not affect the fulness of the vessels. Below the disk is a triangular hemorrhage, its apex nearer the lower margin of the disk. A disk diameter outward from the disk the fundus appears mottled, the pigment epithelium degenerated, and the stroma cells in part proliferated. Farther in the periphery there are many linear pigment spots in the retina, particularly outward and downward. In the pigmented areas there is marked atrophy of the choroid with thickening of the walls of the vessels. In place of the earlier opacity between the disk and macula, one sees some yellowish-gray spots in the retina. The medial half of the retina is free from pigment."

CASE 3.—Optic-nerve tumor. Tenotomy of internal rectus; ophthalmoscopic changes twenty-four days after operation. "To the temporal side of the disk (inverted image?) slight discoloration of the fundus: yellowish spots alternate with pigmented spots. The pigment appears in patches and in lines and is black as

carbon. Along the course of the inferior vessels there is diffuse rarefaction of the fundus, with deposits of pigment in the retina. In the other portions of the fundus no pigmentation is visible."

Ophthalmoscopic appearances two weeks later :

Extending from the disk to the temporal periphery of the retina is a zone in which the retina contains patches of black pigment irregularly arranged. Among the pigment patches here and there the color of the fundus is lighter than normal. At one point within a patch of pigment a yellowish choroidal vessel is visible. In the remainder of the fundus there is no pathological pigmentation."

Many other cases reported had similar fundus changes. Scalinci, a month after operation, found :

"The retinal circulation restored. The pigment spots are more numerous, but limited to the nasal half of the fundus."

In this case, and in the following case reported by Gruening, there was no note as to the side of the orbit entered.

Five weeks after the operation : "The veins cannot be distinguished from the arteries. Many retinal vessels become small a short distance from the disk and grow broader in the periphery. The choroid is markedly atrophic on its temporal side and the overlying retina is pigmented in great plaques."

Thus in a great number of cases of optico-ciliary resection in which the fundus was examined some time after the operation, we find the same condition that was found anatomically in our case, namely, a marked degeneration and pigmentation of the half of the retina corresponding to the wound in the conjunctiva and Tenon's capsule made in tenotomizing the rectus muscle.

Schlodtmann explains the condition as we do. He says : "Perhaps the pigmentation of the retina and the atrophy of the choroid are the results of extreme nutritive disturbances in the eyeball, and it is *a priori* probable that if the anterior ciliary arteries were cut, visible changes would occur in the portions of the retina and choroid dependent upon the blood supply of these vessels."

The cases in which no degeneration and pigmentation appeared, such as Adamück's case and Schlodtmann's first case, were, for the most part, cases in which immediately after the operation there was no narrowing of the retinal vessels or any other change in the fundus. Schlodtmann's explanation here is that at the time of operation the retinal vessels compressed by the tumor had ceased to supply the retina, which was then nourished by the choroidal vessels, and, if the posterior ciliary vessels had been compressed, by the anterior ciliary vessels, the slow growth of the tumor permitting the development of such collateral circulation.

From what has been said it is clear that the atrophy and pigmentation on the temporal side in our case were doubtless due to division of the posterior ciliary vessels plus division of some of the anterior ciliary vessels. Only in the rabbit are the posterior ciliary arteries end arteries. Only in this animal is division of one long ciliary artery sufficient to cause these changes in one-half of the fundus. In man the collateral supply is better, and division of the posterior vessels alone is not sufficient to produce the fundus changes.

As regards the circulation in the choroid, we found that the nasal half of the choroid in our case contained an average amount of blood, but that in the temporal half there was a pronounced hyperæmia with extravasations of blood. These conditions mean that on the nasal side well-developed collaterals provided a sufficient blood supply, while on the temporal side the conjunctival incision and tenotomy had so reduced the collaterals that the choroidal vessels were over-filled with blood which was not in active circulation, leading to stasis and diapedesis of the blood cells through the ill-nourished vessel walls.

The fact that at localized points in the nasal half of the retina the pigment epithelial cells were enlarged and detached and pigment masses lay free in the retina, is explained by supposing that the collaterals of the nasal half of the choroid were not able to nourish the entire nasal half of the choroid after division of the posterior ciliary vessels. At various small points there were stasis and anæmia, giving rise to degeneration and pigmentation of the retina.

It remains to inquire into the nature and source of the large masses of pigment found in the temporal half of the retina.

When our preparations are carefully studied, it is seen that at particular points these large clumps of pigment still are arranged along the lamina vitrea (Fig. 4). At other points they are detached but lie in regular order in the cleft between choroid and retina (Fig. 5). So it is impossible not to believe that we have to do with enlarged and markedly pigmented pigment epithelial cells.

An enlargement of the pigment epithelial cells in nutritive and circulatory disturbances of the choroid is observed after experimental injury of the choroid in animals and also after pathological processes in the choroid in man. For example, after division of the ciliary vessels Wagenmann²⁰ and Krückmann² found it in the rabbit, and Capauner⁴ in the frog. As regards similar changes in man, I would call attention to the changes found in the pigment epithelium by Wagenmann,²¹ Bürstenbinder,³ Deutschmann,⁶ Gonin,⁸ and others in retinitis pigmentosa; to the marked enlargement and proliferation of the pigment epithelial cells in a patient with arteriosclerosis in the choroid described by Siegrist; and to the familiar changes in the retinal pigment epithelium in cases of focal choroiditis and in the old as described in detail by Kuhnt¹³ and Rosa Kerschbaumer.¹¹

Usually the cells are enlarged and the pigment contents diminished. In our case, on the contrary, the pigment is much increased until it seems to be almost homogeneous, and only at the margins of the clump are individual pigment granules to be made out (Figs. 4-8). Clumps of pigment as large as these were found by Capauner and Krückmann in their experimental studies and by Leber and von Hippel¹⁰ in their studies on bits of metal in the eye.

Krückmann¹² says: "If the atrophy of the retina extends to the inner layers, a process which happens quickly after the introduction of metals into the vitreous, further changes take place in the pigment epithelium and large clumps of pigment appear."

Whence come these clumps of pigment? Either they are,

as Krückmann suggests, degenerating and degenerated grouped cells or cell derivatives, or they are phagocytic cells which have taken up the fuchsin granules of degenerated pigment cells, or they are pigment cells in process of division—that is, cells in which there are newly formed fuchsin granules.

Autochthonous development of organic pigment in fully developed cells is unknown. The genesis of these clumps through cell division must be considered highly improbable. After bleaching, all these pigment clumps exhibit well staining nuclei, showing that they are not composed of degenerated cells. It would seem likely that these clumps of pigment, which in some sections rested on the lamina vitrea at the site of the pigment epithelium, in other sections lay in the space between the choroid and retina, and in others still lay scattered through the retina, were composed of viable cells which had taken up other pigmented cells, or at least the pigment of other cells.

What, then, are these phagocytic cells? Are they leucocytes, as Wagenmann assumed in his cases, or are they pigment epithelial cells, which from lack of nutrition have acquired phagocytic properties, and have absorbed broken down pigment epithelial cells, and thus become large and densely pigmented, and actively or passively have found their way into the atrophied retina? There is no question here of phagocytic leucocytes, since round cells are nowhere to be found in the retina.

The suggestion that the pigment epithelial cells have the power of taking up pigment from broken down cells, and thus of playing the part of phagocytes, was made by Leber in his studies on the effect of bits of metal in the vitreous. And von Hippel,¹⁰ in human eyes that had contained splinters of steel and in rabbits' eyes into which iron had been introduced, found similar large, densely pigmented cells, which he took to be pigment epithelial cells, which from some excitation had enlarged, proliferated, and become loosened, and had furthermore acquired the power to absorb foreign substances and to wander actively.

Capauner⁴ and Gayet and Aurand⁷ saw similar cells. Capauner believed them to be pigment epithelial cells and

Gayet and Aurand inclined rather to the view that they were leucocytes which had taken up the pigment of broken down epithelial cells.

I am of the opinion that these cells are enlarged phagocytic pigment epithelial cells which have absorbed degenerated cells of their own kind. The number of these cells in the sections is less than would be that of normal pigment epithelial cells, so that unquestionably many of the pigment epithelial cells have broken down. The presence of well staining nuclei in the cells free in the retina would seem to indicate that they had migrated actively from their original position.

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Fig. 1.

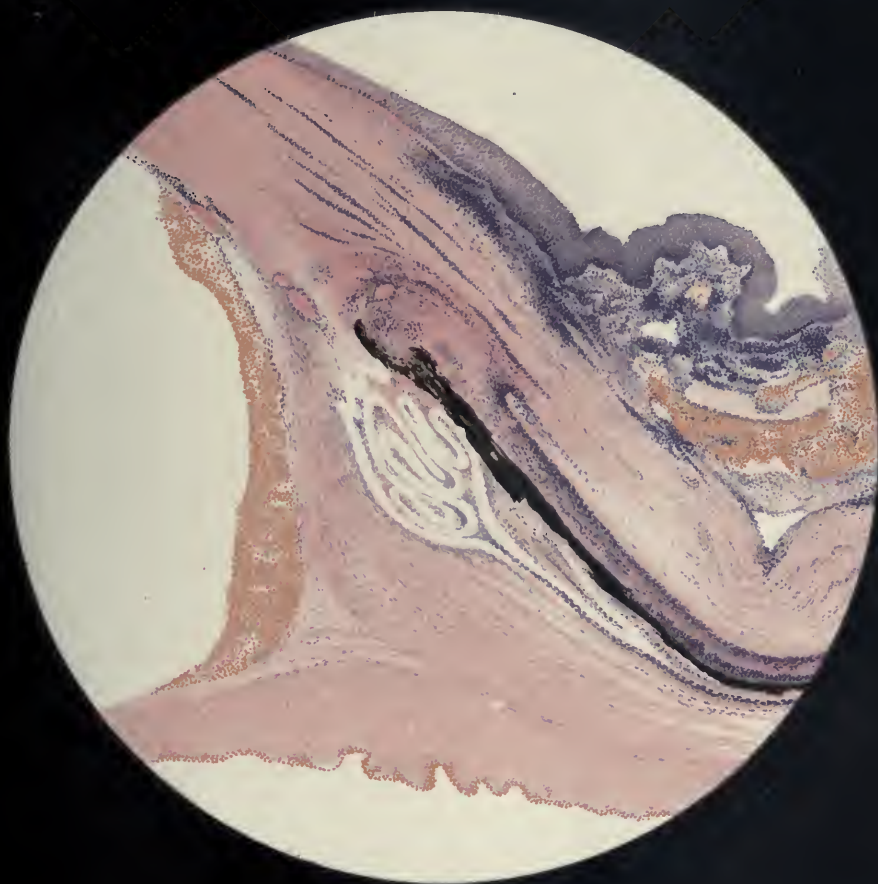


Fig. 2.

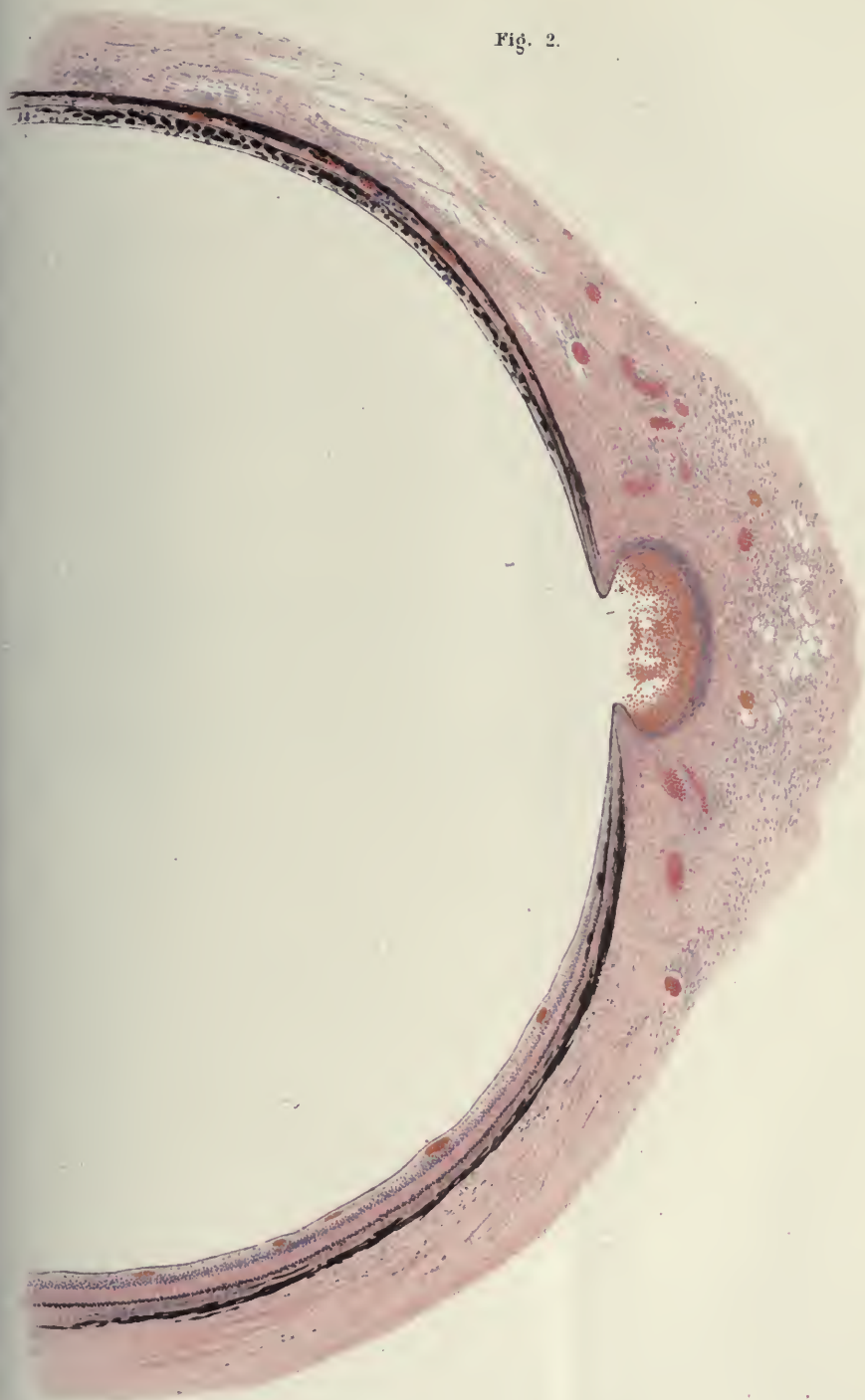


Fig. 3.

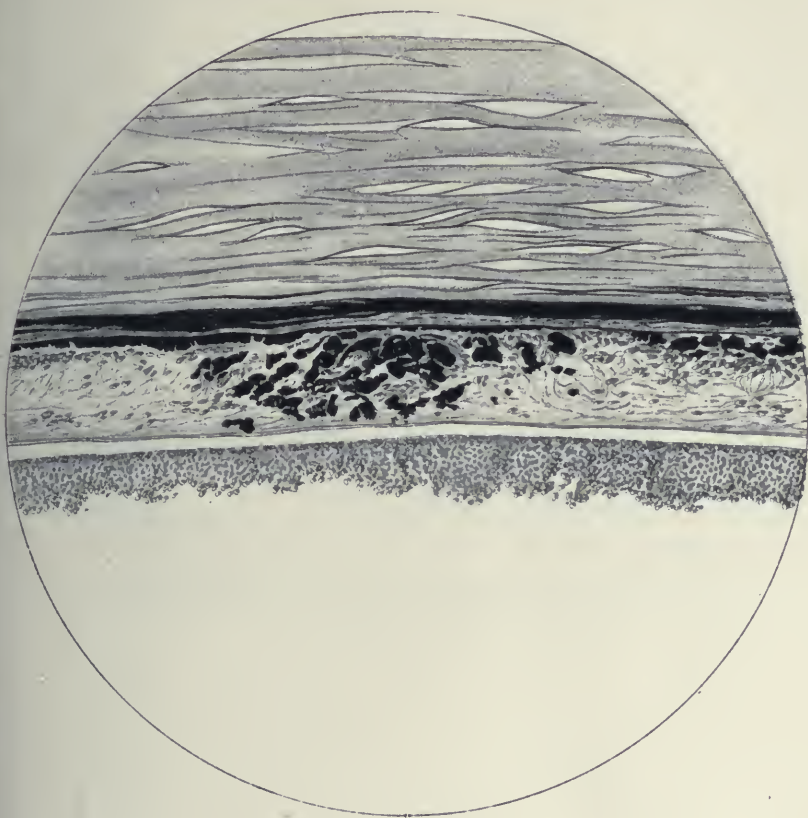


Fig. 4.

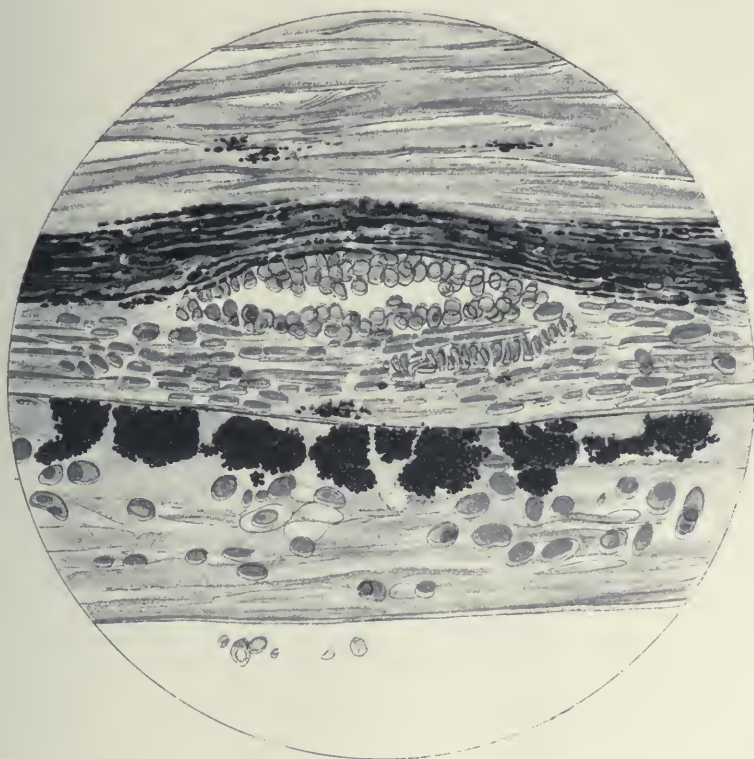


Fig. 5.

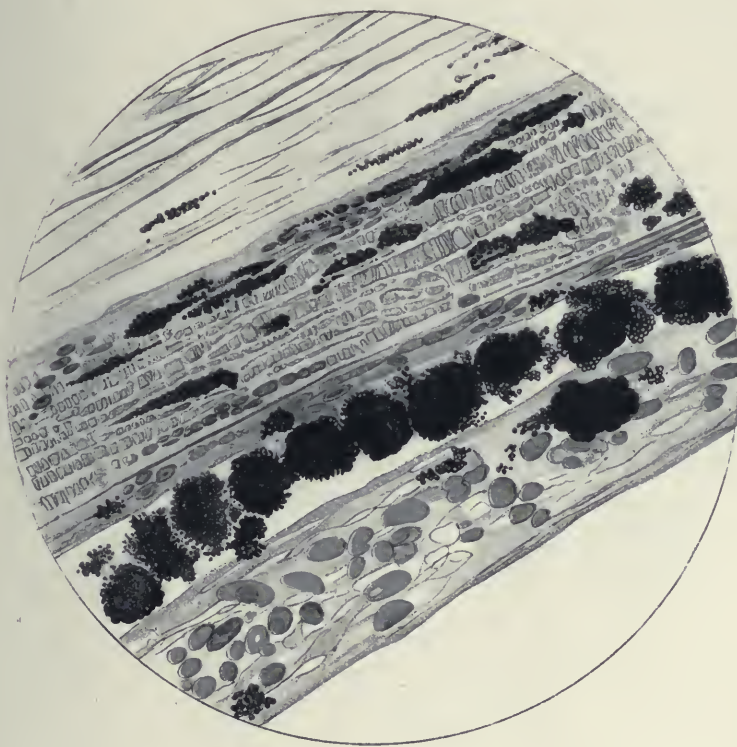


Fig. 6.

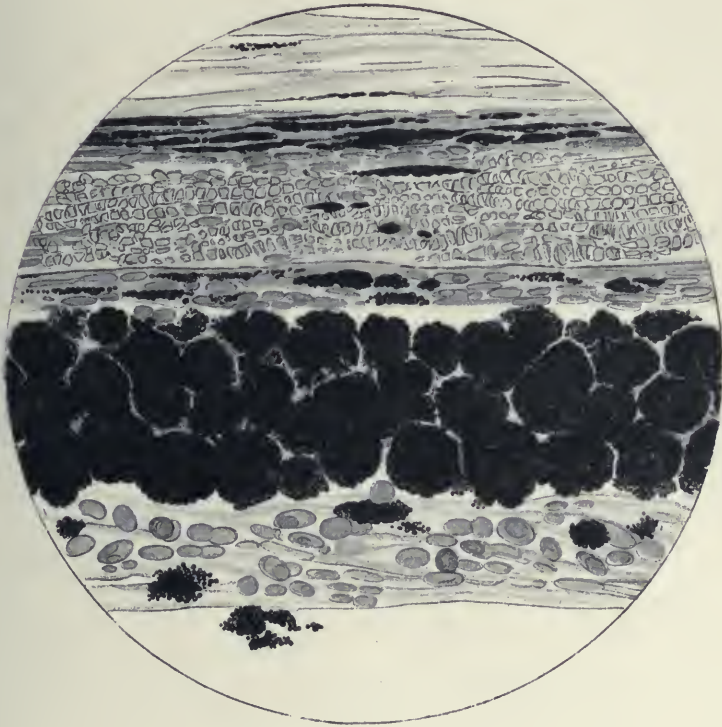


Fig. 7.

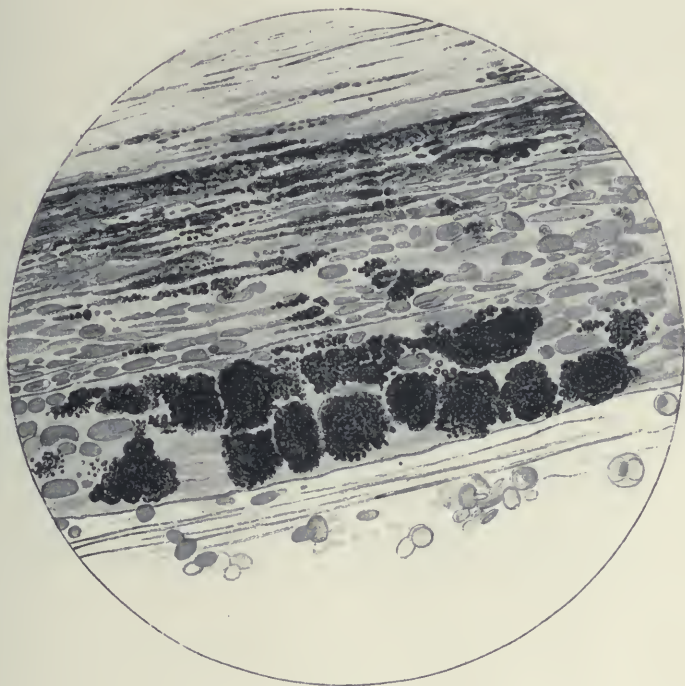
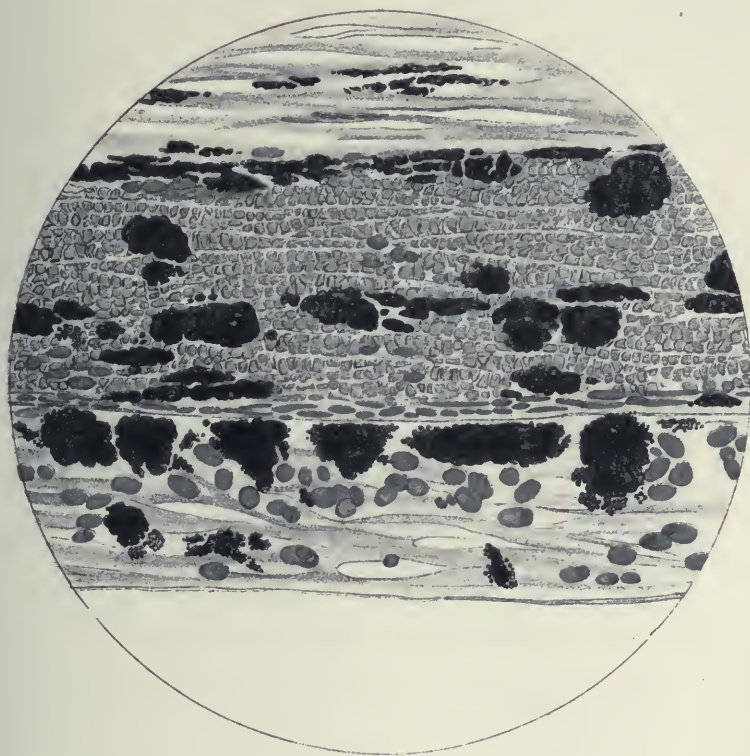


Fig. 8.



POSTERIOR SCLEROTOMY AS A PRELIMINARY TO IRIDECTOMY IN ACUTE GLAUCOMA.

By ARNOLD KNAPP, M.D.

PRIESTLY SMITH in the chapter on Glaucoma, p. 680, in *Norris and Oliver's System*, describes scleral puncture as a preliminary to iridectomy in glaucoma to permit a more thorough operation. He has performed this combined operation in more than 50 cases without any ill effect referable to the additional step and with the impression that the results have been improved thereby. I have been practising this combined method under more restricted conditions and apparently with advantage. The cases which to me seem to require this preliminary operation are cases of primary acute glaucoma or chronic glaucoma during an inflammatory attack where the eye is very hard and the anterior chamber so shallow as not to permit a satisfactory incision.

The following seven cases were treated by this method. The operation was performed under general anæsthesia. The method followed was the one described by Mr. Smith. On turning the eye well inward, exposing the outer surface of the sclera, the sclera is punctured with a cataract knife a little above or below the horizontal meridian; by rotating the knife vitreous escapes. The sliding conjunctiva protects the incision. The eye becomes soft, the anterior chamber deepens. The ordinary iridectomy then follows.

CASE 1. A. MCK., sixty-two years old. After three weeks of acute glaucoma, $V = \frac{10}{200}$, combined posterior sclerotomy and iridectomy were performed on September 15, 1905. No reaction.

Two weeks later, vitreous clear, tension normal. $V = \frac{20}{200}$. The field concentrically contracted. On October 17th (the last visit) the tension was normal. $V = \frac{20}{20}$. Arteriosclerotic changes in both maculæ.

CASE 2. F. K., fifty-six years of age. The right eye was enucleated for painful absolute glaucoma two years ago. On September 29, 1904, he came to the hospital with a very marked attack of acute glaucoma in his remaining eye. The anterior chamber was practically obliterated, cornea steamy. T+2. This attack had occurred suddenly on that morning. He got up experiencing great pain and loss of vision. Under ether a posterior sclerotomy and iridectomy were performed without incident, except that after the sclerotomy the anterior chamber did not deepen as much as usual, and the lens remained permanently displaced forward, making the eye myopic. Subsequently the tension remained minus for some weeks, as it frequently does after this operation, and then became normal. Some minute hemorrhages were seen in the fundus. On date of last visit, Jan. 17, 1905, $V - 2D = \frac{20}{20}$. The lens is still extremely far forward. The vitreous is clear. Optic nerve n. Tension n. Some months later he died from apoplexy.

CASE 3. A. J. J., fifty-nine years of age, left absolute glaucoma. Right loss of vision for three months, premonitory attacks during one year. At present there is acute glaucoma with only perception of light. Under ether a combined operation was successfully performed. The tension was relieved. No reaction. Vision improved to $\frac{10}{100}$. Subsequently the cataract was removed and the optic nerve was found atrophic. The field was very much contracted. Later the tension increased and eserine had to be regularly instilled. The patient returned to his home in Panama and subsequently became blind.

CASE 4. A. S., aged fifty-one, was first seen in April, 1904, suffering from an acute exacerbation of chronic glaucoma. The eye has been inflamed for five weeks. The vision was reduced to recognizing the movements of the hand in the temporal field. The combined operation was performed under ether. On leaving the hospital the tension was normal. The vision somewhat improved. On May 21, 1906, $R = \frac{10}{100}$. F: nasal defect to near p. f. Od.: cupped, atrophic. T n.

CASE 5. D. A., aged sixty-six. Acute inflammatory glaucoma, left, of two weeks' duration. Vision reduced to perception of

light. Under ether the combined operation was satisfactorily performed on December 18, 1904. The pain was relieved, tension normal. On January 3, 1905, Vision, could count fingers. T n. On May 21, 1906, $V = \frac{20}{100}$. T n. Nasal contraction of field to 40° .

CASE 6. A., seventy years of age. Acute exacerbation of chronic glaucoma, with faint perception of light, and cataract. Combined operation on August 31, 1904, without incident. September 13, 1904, the date of last visit, T n. L. p. uncertain, especially nasal.

CASE 7. A. K., twenty-eight years of age. This patient applied for the relief of pain on account of glaucoma secondary to dislocation of the lens into the anterior chamber, which had resulted from an old traumatism. There was complete atrophy of the iris. It was decided to precede the extraction of the lens by a posterior sclerotomy. When the knife had penetrated the sclera and some vitreous had escaped, blood appeared after a few seconds in the bottom of the anterior chamber. There was no bleeding from the site of puncture. The lens was easily removed through the customary corneal incision, but as the corneal wound gaped slightly an intraocular hemorrhage was surmised and the patient's eye was quickly bandaged. In $\frac{1}{2}$ hour the bandage was saturated with blood. The usual history of intraocular hemorrhage followed and the eye was enucleated one week later.

Though the number of cases reported is small they nevertheless, to my mind, confirm the advantages of this method of operating under certain conditions. There is no doubt that the preliminary reduction of tension is a great aid to obtaining a proper corneal section and a satisfactory coloboma. The hypotomy of the eye after operation enables the instillation of atropine to be kept up for several days. Whether the operation in the favorable cases exerted any particularly beneficial action on the glaucomatous process, beyond permitting a thorough iridectomy to be done, is a question which cannot be answered, nor does it enter into the province of this paper. The only case in which this combined operation apparently aggravated the condition was the one (Case 7) in which an intraocular hemorrhage occurred. This fatality would, I think, have also followed the usual

operation, as the eye was a degenerated one. The hemorrhage did not appear at the site of the scleral puncture, and so presumably took place from the relaxation of the intraocular tension and not from the scleral incision.

TWO CASES OF OSTEOMA OF THE ORBIT SUCCESSFULLY TREATED BY OPERATION.

By ARNOLD KNAPP, M.D.

(With a photograph on Text-plate IX.)

THE two following cases of osteoma of the orbit illustrate the difference in the site of origin in these tumors; they were successfully removed by operation without involvement of the eyeball.

CASE 1.—J. C., female, twenty-eight years. A swelling had been noted below the eyebrow in the orbit for some years. This had increased in size.

On examination there is a nodular, hard tumor to be felt within the orbit in the upper and inner angle. The eye is normal except that it is displaced down and out. Nose not involved. The nodular, hard growth, the position, and the slow increase in size made the diagnosis of osteoma certain.

Operation August 31, 1905. Usual curved incision along the convexity of the eyebrow, down to the nose; on separating the periosteum the tumor was disclosed with a narrow neck to which the periosteum was attached. The attachment was to the upper part of the posterior half of the ethmoidal os planum. With a chisel the bone was divided just anterior to the attachment; the growth was then readily detached as the pedicle was small, measuring about 1 cm in diameter. The tumor was freed from the surrounding soft parts and removed from the orbit. The site of attachment appeared healthy, and the ethmoidal cells were not further opened. The wound was closed with sutures and healed by primary union. Subsequent course uneventful.

October 16th.—The eye has returned to its normal position.

There is no deformity. Vision normal. Some diplopia in lower part of field.

The tumor measures $2 \times 3 \text{ cm}$. The accompanying photograph shows its shape and attachment. (See illustration.) As the periosteum was tightly adherent to the neck of the tumor, it is probable that the growth took place superficial to the bone.

The second case is more interesting, as the bony nature of the growth was not determined until the operation.

CASE 2.—M. A., female, twenty-nine years old. Eight years ago patient states that the left eye would "swell up"; occasional headache; the eye has been steadily becoming more prominent.

On examination left eye is displaced forward and downward on the cheek. On palpating the region of the upper lid a hard nodular tumor is encountered just within the orbital margin; the lachrymal gland is displaced. Most of the mass seems to spring from the upper and inner wall.

Left eye: OD, some congestion. $V = \frac{20}{100}$.

Operation December 6, 1905. Usual incision. Very free hemorrhage; difficult to detach periosteum. On doing so, glarish viscid mucus escaped from above and inward (frontal sinus). A nodular mass was found occupying the upper half of the orbit, with a firm, broad attachment to the entire upper bony wall. Owing to the broad attachment it was necessary to remove the tumor in fragments. This was difficult as the bone was very dense. The tumor sprang from the superior (cerebral) wall of the frontal sinus; the attachment extended one and three-quarter inches back from the orbital margin. A narrow rim of bone remained anteriorly of the inferior (orbital) wall of the frontal sinus which had been perforated by the growth. In removing some of the tumor internally the dura was exposed. In the posterior half of the orbit the periosteum appeared as a thickened whitish membrane. Posterior to the tumor an œdematous polypus was encountered. Wound left open. Gauze drain to dura. The tumor removed measured approximately $4 \times 2 \text{ cm}$ and weighed 5.15 g.

Uneventful recovery. Wound closed in eleven days.

No deformity except the eye has remained lower down than normal. Diplopia in lowest field. Vision unchanged.

ILLUSTRATING DR. ARNOLD KNAPP'S CASE OF OSTEOMA OF THE ORBIT.



Exostoses of the orbit are not uncommon. La Grange¹ has collected 148 cases. They are only partly derived from the periosteum as an osteoma of the frontal and sphenoidal sinuses may arise from the embryonal cartilaginous rudiments of the ethmoid (Lesser²). They then enlarge and break through the bony walls and extend into the orbit or into the skull. Panas³ states that the sinusal exostoses are covered with a fibro-mucosa which becomes red and cystic. The site of predilection is the upper and inner walls of the orbit. The extension inward into the cranial cavity is of course very serious. This is, however, very rare. Symptoms suggestive of this extension are absent in most cases. La Grange says that there are only very few on record which have caused grave cerebral symptoms. A fatal termination in these cases, if left to themselves, is also very rare; of ten cases two were fatal. This extension into the cranium need only be suspected, if the osteoma arises from the upper wall of the orbit.

As to treatment, the difficulties and dangers of operation vary with the location and breadth of attachment of the tumor. These tumors can generally be safely removed with preservation of the eyeball. Some cases have succumbed to meningitis after operation; though these mostly occurred in the pre-antiseptic era, some are of recent years. The mortality of the operation, according to La Grange, has fallen to six per cent. since the days of antiseptis. The removal of a pedunculated tumor as in our first case is very simple. In the second case, where the attachment occupied nearly the entire roof of the orbit and an intracranial extension could not be excluded, it is better to only resect the orbital mass as has been advised by Panas.

¹ *Traité des Tumeurs de l'Œil*, etc., vol. ii., p. 346, 1904.

² *Allgemeine Chirurgie*, ii., p. 288, 1905.

³ *Maladies des Yeux*, vol. ii., p. 417, 1894.

EYE INFECTION. THIRD HUNDRED CASES WITH BACTERIOLOGICAL EXAMINATION.

By Dr. DORLAND SMITH, BRIDGEPORT, CONN.

THE statement of careful observers as to the many kinds of bacteria present in the healthy conjunctival sac, the inability to prove or disprove by animal inoculation the causal relationship of germs to the infection of the eye from which they were isolated, the lack of time and the difficulties of technique which practically prevent the busy man from doing laboratory work, and our failure, without actually doing this work, to appreciate fully the meaning of cultures and the care required to make them informing and not misleading—all these create some confusion in our ideas of the bacteriology of eye infection. But we are making progress, and this state of mind will not continue.

It is well known that the variety of micro-organisms which may *occasionally* be present in the healthy conjunctival sac is very large. *Practically*, however, but few kinds of organisms are commonly found, the so-called "normal" inhabitants of the conjunctival sac. The pyogenic cocci and bacilli of the xerosis, colon, and subtilis groups, some of which have pathogenic possibilities, are the commonest of these. These organisms are not numerous, under normal conditions do not propagate, and do not ordinarily cause infection without another factor generally called, for want of a better term, "lowered resistance." Ordinarily the eye has special protection against germ invasion. The resistance of healthy epithelium to germ entrance, the phagocytosis, the constant flushing of the tears, the mechanical scraping of the lid

edges, contribute to this protection, tend to rid the eye of these "normal" inhabitants, and do succeed in keeping their number low. When this resistance is lowered, either through impairment of the general health or by some injury to the conjunctiva or cornea, and a way of entrance for the germs is provided and infection results, the infecting germ becomes more numerous—much more so than the other germs which happen to be present, which are still kept more or less in check by the same agencies as before. Thus the presence in small numbers of adventitious organisms, or of the common germs of the healthy conjunctival sac in an infective condition, does not preclude the discovery of the infecting germ. It does require greater care in the examination and greater exercise of judgment to prevent mistakes. There is the least likelihood of error if the conjunctiva is thought of as an exposed Petri plate, and the material under examination as probably already contaminated by a few adventitious organisms; too few to appear prominent in the smear, but which may overgrow and entirely vitiate the culture unless it is carefully watched.

In the search for the infecting germ, both smear and culture of the infected material should be made. While examination of smears alone is often useful, when it is possible to study cultures with care the great increase in accuracy well repays the increase in time and trouble. In the smear the kinds of organisms and the relative number of each should be noted, their morphological and staining peculiarities and their relation to the pus cells and to each other observed. This is necessary both as a basis for judgment as to which are infecting and which accidental organisms, and because some of the organisms which infect the eye do not grow on ordinary media, or do so only with difficulty, and without a smear they would not be discovered at all. Cultures should be made on appropriate media to verify or disprove conclusions from the smear as to the kind of organisms causing the infection, and to isolate the infecting organisms for accurate identification.

Except in the case of a few organisms of characteristic morphology, identification from the smear alone is often

quite uncertain. At the same time the possibilities of error introduced in making cultures should be kept in mind; not only accidental contamination, through faulty technique, but especially the growth of the adventitious or normal organisms. For this reason cultures uncontrolled by examination of the smear may be quite misleading. To minimize the chances of error from this source the infective material should be spread over the whole surface of the culture media, the growth inspected at frequent intervals, and those organisms isolated and studied which were prominent or abundant in the smear and in closest relation to the pus cells, and are therefore the probable infecting agents. The few widely-scattered colonies of the common inhabitants of the conjunctival sac may be neglected, as presumably they have little connection with the infective process, but were accidentally introduced into the eye from the air.

It is unfortunate that it is not usually possible to obtain by animal inoculation complete proof of the etiological relationship of the organism we have isolated to the disease of which it is the probable cause. But the fact remains that many germs which infect the human conjunctiva will not infect that of animals. We have therefore to assume that certain organisms are the cause of certain eye diseases without this absolutely complete proof. We do this because all the facts we can obtain point to the truth of this assumption. We find, for example, in an epidemic of conjunctivitis the same organism predominating in the conjunctival discharge of all the cases, or the only constant organism in all or in a majority of them (excepting, of course, the few normal inhabitants of the conjunctival sac). Thus we find Koch-Weeks bacillus in some epidemics, pneumococcus in some, and in some, other germs.

In another class of cases we may have a history of direct inoculation, as of gonococci from urethra to eye, or of Klebs-Loeffler bacilli from nose to eye, and find the same sort of infection and the same kind of germ in both places. In still another class the results from treatment indicate the nature of the germ infection. Thus the cases of subacute conjunctivitis in which the diplobacillus is the only constant

organism yield readily only to zinc ; diphtheritic conjunctivitis likewise to anti-toxin. There are so many of these cases in which all the facts at our disposal point to the same conclusion that it is difficult not to believe that the abundant germ is usually the specific cause of the infection.

We report one hundred more cases of bacteriological examination of secretion from the eye. These examinations were made whenever secretion was present. The cases occurred in the private practice of Dr. F. M. Wilson and myself in the ophthalmic clinic of the Manhattan Eye and Ear Hospital, and in the wards of the Bridgeport Hospital. They include all the eye cases in which any attempt at bacteriological examination was made. Some of the laboratory work was done in the Sheffield Bacteriological Laboratory of Yale University, and my acknowledgments are due to its head, Prof. L. F. Rettger, for valuable assistance ; also to Dr. E. M. Blake, who made a few of the laboratory examinations ; and especially to my colleagues at the Manhattan for the cases which they have put at my disposal.

Technique.—This was essentially the same as in the preceding two hundred cases,¹ except that the conjunctival discharge was more often collected by the sterilized platinum loop and transferred directly to the culture tubes and slides. Both smears and cultures were regularly made, and such organisms as grew and were also present in any considerable number in the smear were isolated in pure culture and identified by the usual methods.

One hundred and one patients are included, 145 eyes being affected. The cases are grouped as infections of the conjunctiva (70 cases), of the cornea (9), of the lachrymal sac (7), and other cases (15).

CONJUNCTIVAL INFECTION: 70 CASES, 110 EYES.

Koch-Weeks Conjunctivitis. Twelve cases. In all these the slender, faintlystaining bacilli were found in considerable num-

¹ *Yale Medical Journal*, May, 1904, and *Manhattan Eye, Ear, and Throat Hospital Reports*, vi., 172 ; *ARCHIVES OF OPHTHALMOLOGY*, xxxiv., 5, and *Manhattan Eye, Ear, and Throat Hospital Reports*, vii., 137.

bers in the smear, usually both in and between the pus cells. In two cases only were cultures made, one on serum agar showing Koch-Weeks bacillus in pure culture, the other on blood serum showing xerosis only. Only one case occurred in Bridgeport. This was in a woman of twenty-three, five days' duration, and severe enough so that some one had used atropine. Recovery in four days under boric acid solution and hot water. Eleven cases occurred in the clinic at the Manhattan: 2 in children, 8 in young adults, and 1 in a man of fifty-three. All but two were males. In all the ocular conjunctiva was quite red (pinkeye), and in most the secretion was free. In eleven cases both eyes were affected, usually one a day or two before the other, the patient coming in soon after the second eye became affected. The treatment was regularly boric solution every two hours, and argyrol two to four times a day. Recovery in four to seven days in the cases which remained under observation.

Pneumococcus Conjunctivitis. Four cases. These were all rather mild. One was a clinic case in a boy of four, right eye only affected; three were in men. The pneumococcus was found alone in smear from three of the cases and in culture in all of them. In two a few colonies of the adventitious organisms (staphylococcus and xerosis) also appeared. Treatment was boric solution; one had hot water and one argyrol also. One was well in five days, one in six; the other two were not seen again.

Streptococcus Conjunctivitis. One case. This was in the right eye of a woman of fifty, who had had an abscess of the right lachrymal sac three years before. Streptococci and a few xerosis bacilli were found in the conjunctival discharge. Under boric and hot water the redness and secretion disappeared in a few days and the patient was dismissed. Three weeks from the date of the first visit she returned with another abscess of the right lachrymal sac. This was opened externally and streptococci were found in the abscess and again in the conjunctival discharge. A localized erysipelas then developed about the wound. After this cleared up and the prominent symptoms were relieved by probing, the patient disappeared.

Gonorrhæal Conjunctivitis. Five cases. Two of these were in boys of two and four, brothers, whose parents declined hospital treatment, and the patients were seen but once. The other three were adults. One was a savage infection in a woman of thirty-nine, who had been poulticing her eye with tea leaves. The pus was examined and gonococci found. She was treated in the Manhattan Hospital, but her physician reported that the resistance had been so lowered by poulticing that corneal invasion could not be prevented, and the final result was P L only.

A girl of fifteen entered the Bridgeport Hospital with an active infection of the right eye of twenty-four hours' duration, with great swelling of the lid. Twenty-four hours later a slight haziness appeared in the centre of the cornea, but disappeared under atropine and cleansing with boric and vaseline every half hour by special nurses, without any break in the epithelium, and without any resulting opacity. The left eye became infected in spite of precautions, but cleared up rapidly under the same treatment. Discharged well in ten days.

The fifth case was a woman of fifty-five, who entered the hospital with a severe infection of the right eye, thirty-six hours old. There was so much swelling of the lids as to almost prevent opening them, and a hard, pale chemosis surrounding the cornea. Under cleansing with boric solution and vaseline every twenty minutes by special nurses the secretion lessened and the chemosis did not increase. Within thirty-six hours the other eye became infected and argyrol, 30 per cent., was used, one drop q 1 h in the second eye, q 2 h in the first eye. This caused smarting in the first eye only. The second eye was well in two days. The first eye, without any apparent infection of the cornea, lost most of the corneal epithelium, the cornea staining deeply with the argyrol. Discharged in twenty-six days with faint opacity. One cannot feel quite sure that the argyrol had no part in the loss of epithelium.

In all these cases the characteristic biscuit-shaped diplococci, decolorizing by Gram, were found in abundance in smear, both in and out of the pus cells. Cultures were made

in one case. In this the gonococci grew very slightly on the blood serum, as they exceptionally do, and xerosis bacilli were also present.

Staphylococcus Conjunctivitis.—Twelve cases. In seven of these the predominant organism was very abundant in the smear, and was found to be one of the pyogenic staphylococci by cultures on blood serum, agar, and gelatine. The secretion was very free, and the cocci were often in the pus cells. All but one case were mild. In three cases the staphylococcus occurred alone, in three xerosis also, and in one with another bacillus. One boy of six had staphylococcus albus and a few xerosis. Two clinic children, with considerable pus, but little redness or swelling, showed *S. aureus* and albus. In one case the organism was the cereus. The outcome of these is unknown. The conjunctival discharge from the irritation of an artificial eye in a woman of sixty showed *S. aureus* and albus. A girl of thirteen with traumatic cataract after seven weeks of occlusion developed a free secretion containing *S. aureus* and xerosis. This subsided without treatment other than cleansing at the daily dressing, the occlusion being continued. In an acute conjunctivitis with faint corneal disturbance, puffiness of the lower lid, and watery oedema, in a man of sixty-four, the discharge showed *S. aureus* and xerosis in small numbers in smear and culture. Recovery in two weeks under boric, hot water, and argyrol. It is by no means certain that the staphylococcus had anything to do with this process, especially as a similar attack, except for the corneal disturbance and with pneumococci predominating, occurred two months later.

In five cases of mild purulent conjunctivitis in which no cultures were made smears showed abundant cocci, positive to Gram, and often intracellular, which were probably staphylococci. Three cases were in children of seven days, two and three years respectively, both eyes affected. Two of these were not seen again; in the third the conjunctivitis yielded rapidly to treatment, but an ulcerative keratitis developed which was very persistent. The other two were in babies of seven and ten days, one eye only affected,

recovering in three and two days respectively under simple cleansing with boric solution.

Diplobacillus Conjunctivitis. Ten cases. These were cases of subacute conjunctivitis in the discharge from which the diplobacillus of Morax and Axenfeld, or an organism very like it,¹ was the prominent or sole organism. The symptoms were regularly mild but persistent. Both eyes were affected for some weeks before coming under observation, in two cases more than six months. The slight redness of the bulbar conjunctiva in the palpebral opening, or the velvety thickening of the tarsal conjunctiva of the lower lid, together with the history of long duration, often enabled the diagnosis to be guessed at without waiting for the bacteriological report. Six patients were males, four females; seven were young adults. In five cases the organism was found alone in the smear and no culture was made. Both smear and culture were made in five cases, showing, in addition to the diplobacillus, xerosis in one, an unidentified bacillus in one, and in one a member of the hay bacillus group. The treatment regularly used was the chloride of zinc, $\frac{1}{2}$ to 2 grains to the ounce of boric solution, dropped in the eye three or four times a day. There is no record of the result of treatment in four clinic cases, as the patients did not return. One clinic case recovered in four days. Of the five office cases three received prompt relief from the zinc drops; two of these had used boric solution for three weeks with little improvement; one was a relapse from similar attacks twelve and three months before; one had a relapse four months later, each time being relieved by the zinc solution in two days. The last case required twelve days for recovery, and had a relapse four months later. The identification of the diplobacillus in this case was doubtful, and the hay bacillus was also present.

¹ In these cases of subacute or chronic conjunctivitis with the symptoms described above, which we call diplobacillus conjunctivitis, the cases for which zinc is a specific, we find several organisms, differing among themselves, yet more closely related to each other than to any other organisms, and all giving much the same clinical picture. Of these the diplobacillus of Morax and Axenfeld itself, another larger diplobacillus, and the so-called bacillus of Petit are fairly common.

The Xerosis Bacillus was the only organism found in seven cases of mild conjunctivitis. In three it was present in both smear and culture. One case was an ophthalmia neonatorum; one a purulent conjunctivitis in a baby; one a phlyctenular affection; one a conjunctival affection grafted on an old trachoma. One case showed some redness and little secretion, one free secretion and no redness, one both. All made rapid recovery with simple cleansing. In another case the xerosis was the prominent organism in smear and culture, and there were hay bacilli also in the latter. This patient had the same sort of attack several times, each time with xerosis the prominent or sole organism, and each time getting the most relief from argyrol. She had a Bowman's operation some years ago and has a wide canaliculus and an especially large lachrymal duct, through which it seems likely that the infection comes up from the nose.

In two cases, bacilli only were found but not identified. In a man of 26 with conjunctivitis there was an intracellular diplobacillus in smear; no culture. In a man of 40 with trachoma there were no organisms in the smear but a variety in culture, each in very small number.

No Organisms. In sixteen cases of conjunctivitis no probable bacterial cause for the inflammation could be made out. With one exception these cases were all mild and made quick recovery under cleansing with boric solution. In the smear from most of these cases there were many pus cells and often considerable fibrin; in a few only broken cells and débris. But there were no organisms, or only so few of the organisms normally present on the conjunctiva as to seem clearly adventitious. Blood serum and agar cultures, when made, either showed no growth or a few colonies only of the adventitious organisms. These cases comprised all ages: five were in babies (two ophth. neon.), four in children, and seven adults. Only six were clinic cases. In six there were no organisms in smear or culture; in five none in smear, cultures not made; in four the smear was unsatisfactory; in two of these there was no culture and in two the culture also was unsatisfactory. One of these was a severe case of five days' duration with puffiness of the lower lids,

which took ten days for recovery. In one case a phlyctenule was excised under cocain and planted on blood serum ; but no growth resulted.

CORNEAL INFECTION. NINE CASES, ELEVEN EYES.

There were two cases of necrosis of the cornea. The first, in a man of twenty-nine, followed an infected ulcer, the result of an injury with a piece of horse's hoof. In the pus from the sloughing cornea a small bacillus was very abundant. This was found to be the bacillus pyocyaneus by cultures. No other organisms were present except a very few staphylococci and xerosis bacilli, so few as to be clearly adventitious. Recovery with dense leucoma.

The other case was a peculiar one. A woman of sixty-seven entered the Bridgeport Hospital with a double pneumonia. Her condition became very serious, and for several days there was little hope of her recovery. The right cornea was found to be sloughing, with a large perforation through which the lens escaped. The secretion from the eye contained a very small streptococcus and the bacillus mucosus capsulatus (or a member of that group). Under vaseline and occlusion healing went on quietly, resulting in a dense leucoma with anterior synechiæ. Healing was interrupted by an abscess of the right lachrymal sac which developed a week later, in the pus from which staphylococcus aureus only was found. The left eye for a time remained well ; but while under observation a perforating ulcer developed in spite of treatment. This was small, not quite central, and healed under atropine and argyrol without disturbance of the lens, leaving her finally with vision enough for reading. The germs found in the pus from the left eye were staphylococcus aureus, with a few xerosis bacilli and another bacillus. Was the poor resisting power of the cornea or the virulence of the germs which happened to be present the important factor? Was this a case which would have sloughed anyway from lack of corneal nutrition of the cornea and conjunctiva had been sterile, or was it an infection which was more severe because of the lowered resistance of the cornea?

Three were cases of ulcerative keratitis. In a woman of forty-six treated principally by occlusion, streptococci were prominent in smear and culture of the conjunctival discharge. Aside from an eczema of the cheek which made abandonment of occlusion necessary, recovery was normal. Two weeks later an abscess of the lachrymal sac developed on the same side, with streptococci and an unidentified bacillus in smear and culture. In the case of an ulcer following removal of lead deposit from the centre of the cornea in a woman of seventy-one, the bacterial record is unsatisfactory. In the very free conjunctival discharge in a case of corneal ulcer in a girl of three, staphylococcus albus and xerosis were found in large numbers.

In a case of keratitis of two weeks' duration in a man of twenty the lower third of the cornea was peppered with punctuate infection. The conjunctival discharge was too scanty for a smear, and although staphylococcus aureus and the hay bacillus were abundant in the culture, their relation to the corneal infection cannot be assumed. The man was well in two weeks with atropine, vaseline and occlusion.

An Italian, aged thirty-eight, came to the clinic with mycotic keratitis of two days' duration. He gave a history of similar attacks for the past two years. The cornea and the conjunctiva in the palpebral fissure were dotted with round punctuate spots, white or cream color, slightly raised and looking very much like a plate culture. There was not much irritation for so extensive a process. Under cocain scrapings were taken from the spots in the cornea, using a sterile "baby Graefe" knife and digging well into the tissue. These were transferred to blood serum tubes, but no smear was made. These tubes developed a growth of one of the moulds. The precaution of sterilizing the cocain was unfortunately not taken, and one cannot, therefore, be certain that the mould did not come from the cocain rather than from the mycrotic spot. The outcome of the case is unknown, as the patient did not return.

In two cases of keratomalacia the question of tuberculous origin arose, and under general anæsthesia sections were sliced from the cornea with a Graefe knife, triturated in

sterile water, and injected into a guinea pig. The first was a boy of four, a patient of Dr. Wiesner's. Here iris and cornea were matted together in a granulating mass, in scrapings from which giant cells were found. The pig receiving this inoculation remained perfectly well for three months, when he was used for other purposes. Thus there was no positive evidence, but what evidence there was favored the diagnosis of infective granulomata rather than that of a tubercular process. The child recovered with vision equal to light perception only. The second case was an eight-months-old baby, with both eyes affected, a patient of Dr. Webster's. A similar procedure was followed, the pig in this case dying in a week from streptococcus infection. We therefore have no evidence as to whether this case was tubercular or not.

LACHRYMAL INFECTION. SEVEN CASES.

Three were cases of dacryocystitis in women of seventy-five, forty-one, and fifty-five, with streptococci, pneumococci, and both pneumococci and staphylococci, respectively, in the secretion squeezed out from the sac. Cultures, made in the first two only, confirmed the smear, showing also a very few colonies of the adventitious organisms. Two cases were probed until the prominent symptoms were relieved and then disappeared; one declined probing. Four were cases of abscess of the lachrymal sac. In one, a woman of twenty-seven with a fistula of two months' duration following the abscess, the bacterial examination was unsatisfactory. In a man of forty-one, double abscess, pus from incision showed pneumococci only in smear; no culture. In a woman of forty-six, opened through canaliculus, pus showed streptococci only in smear, and the same organism with some xerosis bacilli in culture. This case has been probed at intervals for six months, and is slowly improving. The probing was interrupted at one time by the appearance of a very hard swelling, red and tender for a few days, with a crescentic edge presenting from within the lower edge of the orbit. This followed the accidental injection of cocain into the tissue along the canaliculus. Under hot water, it disap-

peared entirely in four weeks. The other case is more fully described among the corneal infections. In a sloughing cornea streptococci and *B. mucosus capsulatus* were found. The lachrymal sac on the same side became red, swollen, and tender two weeks later, and in the pus expressed staphylococcus aureus only was found. Recovery with epiphora under expression and hot water without probing.

Two cases, one of ulcerative keratitis, one of streptococcus conjunctivitis, before mentioned, had streptococci in the conjunctival discharge and later developed abscess of the lachrymal sac, with streptococci in the pus from the sac. With these additional cases there were nine in all, eight of which were in women.

OTHER CASES—FIFTEEN.

Tubercular ulcer of the conjunctiva in a girl of sixteen, a patient of Dr. J. J. Thomson's at the Manhattan Eye and Ear Hospital. The ulcer was gray, with slightly undermined edges, and lay over the centre of the tarsal cartilage of the right upper lid, extending rather deeply into it. The appearance of the ulcer suggested tuberculosis, and scrapings were examined in the pathological department of the hospital, but no evidence of tuberculosis was found. There was no loss of weight, no lung or other symptoms of tubercular infection, and no family history of tuberculosis; but, as an enlarged preauricular gland appeared on the same side and the appearance of the ulcer remained suspicious, at the request of Dr. Thomson a large piece of the edge of the ulcer was excised under cocain, and after trituration in sterile water injected into a healthy guinea pig. The pig died five weeks later with generalized tuberculosis. Meanwhile the enlarged gland was excised, and the process there found to be a tubercular adenitis. The conjunctival ulcer healed rapidly under simple cleansing, and up to date, six months later, the patient has remained well.

Papilloma on the tarsal conjunctiva of the left upper lid, five weeks' duration, in a woman of thirty-nine. There had been some pain and bleeding for five days, but neither was severe until within twenty-four hours. Scrapings from the

bleeding surface (after washing with boric) showed abundant staphylococcus albus in smear and culture, and a few unidentified bacilli. The subsequent history of the case is unknown.

Orbital abscess with great exophthalmos in a boy of six, from which a large amount of foul-smelling pus was evacuated through an incision in the lower and inner edge of the orbit. This pus contained a variety of organisms in smear and culture, the most abundant in the smear being streptococci and a slender bacillus morphologically like the tubercle bacillus but not acid-fast. The infection apparently started somewhere in the nose. A week later there was a fistula from the abscess through the anterior end of the inferior turbinate. Five weeks later, an abscess on the side of the nose, apparently starting from the same point as the original abscess, contained streptococci only. The exophthalmos subsided, and complete recovery followed the maintenance of good drainage.

A probable case of lupus in a woman of twenty-seven. When first noticed there was a small swelling on each side of the centre of the margin of the left upper lid, with a smooth cicatrix in the V-shaped notch between. These tumors were slightly red and not at all painful or tender on pressure. On one there was an area of ulceration covered by a scab. As bearing on duration, the woman had been in three months before for glasses, and the lids were then normal. The left pupil was permanently somewhat larger than the right, and contracted very little to light or accommodation. R. V. $\frac{2}{80}$; with $+ 0.50 + 0.25$ c ax 180, $\frac{2}{16}$. L. V. $\frac{2}{80}$; with $+ 0.25 + 0.25$ c ax 90 $\frac{2}{80} +$. Near point about 7 in. in each eye. The patient was poorly nourished, had a persistent cough without much expectoration, and was at times quite hoarse. Sputum examination negative. The throat clinic reported slight congestion of vocal cords only, with no evidence of tuberculosis or syphilis. Vigorous rubbing of the lid margin with yellow oxide ointment was regularly carried out for some months and attention directed toward improving the general health. Under this treatment the ulceration healed and the swellings grew

smaller, at the same time extending each way along the lid margin, leaving a smooth white cicatrix, with some loss of tissue. In about three months the swellings disappeared entirely, the patient gained weight, and the hoarseness and cough disappeared. During this time the New York Board of Health examined her sputum without finding the bacilli, and later gave her the tuberculin test with negative results. Several examinations of the material from the edge of the lid were made, no organisms but the pyogenic cocci being found. After six months, in which she complained only of the trichiasis caused by the entropion, another ulcerated swelling appeared at the outer canthus of the same eye, and the cough, hoarseness, and expectoration returned. Sputum still negative in several examinations. With yellow oxide to the lid and hydriodic acid internally, her general condition is again improving, the swelling growing smaller, but extending somewhat along the lower lid.

Four inflamed chalazia were scrubbed with alcohol, incised and curetted, and the contents examined, with the following results: (1) Abundant staphylococcus aureus in smear and culture; (2) abundant staphylococci in smear, no culture; (3) no smear, xerosis only in culture (this was a large one, full of fluid pus); (4) no organisms in smear, culture unsatisfactory.

Six styas similarly treated showed staphylococcus aureus only in smear and culture in four cases, and staphylococcus only in smear; no culture in the other two. The last case had an acute purulent conjunctivitis with the most intense redness of the bulbar conjunctiva opposite the opening of the styas on the lid. In one of these cases the recurrence of the styas, which had been returning regularly for some months, was stopped by yellow oxide ointment and boric solution. One abscess of a Meibomian gland, from which no smear was made, showed five colonies of *S. albus* in blood serum culture.

Summary.—Of 70 cases of conjunctivitis, staphylococci, the Koch-Weeks bacillus, and the diplobacillus of Morax and Axenfeld were found in 34, practically one-half the cases. The xerosis was found in 8, no organisms in 12, 4 doubtful,

and other germs in 12. In 9 cases of corneal infection, streptococci were found 3 times, staphylococcus, pyocyaneus bacillus, and mould once each, and 3 indefinite. The pneumococcus and the streptococcus are again the prominent germs in the lachrymal cases; in 9 cases the former was found 3 times, the latter 4, 3 of these in lachrymal abscesses. In infections of the lid the staphylococcus aureus largely predominated. In 16 cases no organisms could be found to account for the infection, and in 6 the bacterial record is unsatisfactory.

In mixed infections, where two or more organisms were found in considerable number, these are mentioned in the description of the case; but in making up the table these cases are classed for convenience according to the predominating organism and the other germs put in the "associated" column. Organisms so few as to be presumably adventitious are not mentioned at all.

TABLE OF ORGANISMS FOUND.

	ALONE OR PREDOMINATING				Total	ASSOCIATED
	Conjunctival	Corneal	Lachrymal	Other Cases		
Pneumococcus.....	4		3		7	
Gonococcus.....	5				5	
Streptococcus.....	1	3*	4	1	9	1
Staphylococcus.....	12	1			24	
Morax & Axenfeld Diplo-B...	10				10	
Koch-Weeks Bacillus.....	12		10		12	
Tubercle ".....				1	1	
Pyocyaneus ".....		1			1	
Bacilli of Xerosis Group.....	8			1	9	10
" Subtilis ".....					0	4
No Organisms Found.....	12	2		2	16	
Unidentified Bacilli.....	2				2	6
Exam. Unsatisfactory.....	4	1	1		6	
Mould.....		1			1	
Total.....	70	9	9	15	103	

* Associated with the *Bacillus Mucosus Capsulatus* in one case.

Of the associated organisms, the xerosis was found once each with the pneumococcus, the gonococcus, the Koch-Weeks bacillus, and the diplobacillus, twice with the strep-

tococcus, and four times with the staphylococcus. Organisms of the subtilis group occurred four times, but in no case as the probable cause of infection; once each with the streptococcus and the diplobacillus, and twice with the staphylococcus. The staphylococcus and streptococcus occurred but once together. Unidentified bacilli were found with the streptococcus twice, with the staphylococcus three times, and with the diplobacillus once. Altogether the xerosis group occurred nineteen times, nine of these alone. It is an open question what part, if any, they play in such cases.

Nearly half of the cases were from the clinic at the Manhattan. The most noticeable differences between these and the Bridgeport cases were in the twelve Koch-Weeks infections: only one of these occurred in Bridgeport. This very strikingly confirms our former observation that, while Koch-Weeks conjunctivitis is comparatively common in New York; it is quite rare in Bridgeport, only fifty-six miles away.

A RARE CASE OF THROMBOSIS OF THE CAVERNOUS SINUS FOLLOWING ORBITAL THROMBOPHLEBITIS.

BY DR. FRIEDRICH STOCKER, OF LUCERNE.

Abridged Translation from the *Arch. f. Augenheilk.*, Vol. XLIV. 1901, Supplementary Number, a Festschrift for Dr. E. Pflueger, by
DR. MATTHIAS LANCKTON FOSTER.

THE symptoms of thrombosis of this sinus are :

1. Motor paralysis about the eye.
2. Pain in the region supplied by the trigeminus.
3. Those dependent on obstruction to the flow of blood from the orbital veins into the sinus: increase of intraorbital tension, œdema of the fatty tissue and of the lids, chemosis, signs of stasis within the eyeball due to compression or obstruction of the retinal vessels.
4. Disturbance of vision due either to thrombosis of the retinal veins and the consequent interference with the nutrition of the retina, or to compression of the optic nerve and its consequent atrophy.

Thrombosis of the sinus may occur :

(a) Spontaneously without inflammation or fever. This is known as marantic thrombosis and may be caused by nutritive changes resulting from diarrhœa, atheroma, Bright's disease, the puerperium, or the cachexia of carcinoma.

(b) As the result of traumatism with or without fracture of the bone ; and

(c) From inflammation and injection, either direct or through a phlebitis or thrombophlebitis of the veins which empty into the sinus.

The last method is the most frequent and to it belongs the following case.

The patient was a woman forty-eight and a half years old whose father had died of softening of the brain at forty-two years of age and whose mother had died of apoplexy at sixty-two.

On January 14, 1895, she was struck in her left eye by a window blind, while at the same moment a cloud of dust was blown into her face and eyes which caused a burning and redness of the conjunctiva. This was followed by lachrymation and inability to read with the left eye, associated with pain which increased from day to day. During the night of the third day after the accident she felt a tearing pain in her left orbit, with headache, and she had a profuse perspiration. The temperature was not taken. The symptoms increased in intensity until the pulsating pain in her left orbit and the headache became intolerable during the night of the fifth day. The headache was much aggravated by an attempt to move the left eye. This evening the patient retired early and had another profuse perspiration.

At 5 P.M. of the sixth day Dr. Rappaz noted temperature 39° , pulse 94. Patient very much excited; still going about. Suffusion of blood at outer canthus of left eye. Eyeball markedly exophthalmic, red and a little chemotic; swelling of the conjunctiva. Pupil small; reaction bad. Eyeball very sensitive to pressure. Treatment: antipyrin and ice.

The patient passed a very bad night and was extremely excited. Because of the vomiting and of the intense monolateral headache, she believed that she was suffering from migraine, to which she was occasionally subject.

January 21st.—The swelling of the left eyelid had increased considerably and had extended to the temporal region. Erysipelas was not present. Temp. 39.9° , pulse 98. Morphine was given subcutaneously. During the afternoon of the same day the following record was made: Patient bedridden, excited. The outer region of the left eye much swollen; the skin of normal color except over a bluish-black ecchymosis about 2 cm square near the outer canthus. Marked chemosis visible between the imperfectly closed lids. Voluntary upward movement of the upper lid only 2 or 3 mm. The lid had to be mechanically raised to permit examination of the eyeball. Exophthalmos great; cornea normally transparent. Very slight mobility of the eyeball in any direction; all movements difficult and associated with great pain. Margins of the orbit sensitive to palpation, especially

toward the outer canthus. No fluctuation to be felt. No pulsation of the protruding eyeball. Right eye normal.

The ecchymosis at the left outer canthus naturally suggested that a contusion had caused an intraorbital hemorrhage and a subsequent infectious inflammation of the contents of the orbit, which had produced the exophthalmos together with the other concurrent symptoms. But at that time little could be learned from the patient regarding the details of the commencement of the trouble,—these had to be obtained later.

The pupil was moderately dilated, and all three reactions were very slow.

The media were clear and there were no changes in the fundus except that the veins were rather large, the papilla rather red, and its margin slightly hazy. The vision could not be determined because of the condition of the patient.

January 22d.—Morning temp. 38.80, pulse 96. In the afternoon the patient was apathetic rather than somnolent. The swelling about the left eye had increased and involved the temporal fossa more than on the previous day. There was a pasty œdema over the entire temporal bone. The exophthalmos was extreme, in consequence of which the eye was immovable and could no longer be covered by the lids. Palpation of the orbital margin revealed a place at the site of the ecchymosis so tender that the patient shrank away in spite of the morphine and apathy. The great tension made it difficult to determine whether the skin was adherent to the bony margin or not, but it seemed to be attached to the periosteum.

The patient was anæsthetized and I made a horizontal incision about 3*cm* long through the infiltrated place down upon the bone, beginning at the outer canthus. A few drops of thick pus escaped from the necrotic subcutaneous cellular tissue. No bare bone could be felt with the probe. The wound was then carefully enlarged so as to expose the outer wall of the orbit for a depth of about 3*cm*. It was then irrigated with a warm 1:2000 bichloride solution, a drain of iodoform gauze introduced, and a dressing applied.

The wound was dressed on the following morning. The gauze drain had imbibed a slight amount of pus. Temp. 39°. Pulse 100. Right upper lid somewhat swollen.

In the afternoon the picture had greatly changed. The left eyeball was somewhat less protuberant and the lids were less

tense, while the right eyeball had become so protuberant that the lids could not be closed over it and was immovable. Chemosis was present. No pulsation of the globe. Temp. 39.2° , pulse 92.

I felt no doubt now that the process began as a phlebitis in the left orbit, which had extended through the cavernous sinus to the veins of the other orbit and so had produced an exophthalmos of the right eye, and therefore I pronounced the diagnosis to be infectious thrombosis of the cerebral sinus and the prognosis to be bad. On this day the dressings were changed twice, the wound irrigated each time with warm bichloride solution. Both corneæ were anointed with a 4% mixture of aristol and vaseline to guard against erosion. Morphine and phenacetine were given to control the pain. The vision of the left eye had fallen to movements of the hand at about 50cm, while that of the right was still about $\frac{1}{2}$.

On the following day, Jan. 4th, Professor Pflüger confirmed my diagnosis and recommended enlargement of the wound and the introduction of a glass drain into the left orbit, which was accordingly done.

The ophthalmoscopic condition in the left eye at this time was: Extensive œdema of the retina, particularly below and outward. The arteries were of normal calibre, the veins somewhat dilated, the margins of the papilla obscure, but there was no choked disk and no hemorrhages in the fundus. Vision had fallen to perception of light. Pupil dilated and fixed. In the right eye there were no special pathological changes, with the exception of somewhat enlarged veins and a hyperæmia of the papilla greater than physiological. The papilla was not prominent. The vision was the same as on the day before, while the eyeball had become almost immovable and the chemosis had become very marked. Prof. Pflüger considered the prognosis extremely bad. The general condition of the patient was bad and with the temperature 39.5° , and pulse only 88, seemed to indicate commencing intracranial pressure.

On the following day, Jan. 25th, I was astonished to find improvement. The temperature was 37.6° in the morning, 38.2° at 3 P.M., and 38.4° in the evening without phenacetin. The general condition was not much better, but the exophthalmos on the right side had decreased and there was a slight mobility of the eyeball. The left eye also was less prominent, while the upper lid again presented folds and could be moved by the patient

without trouble. The wound appeared much better. The necrotic portion of the subcutaneous cellular tissue had come away and had left red granulations in its place. The irrigating fluid returned discolored only slightly.

Treatment: quinine sulphate 0.25 t.i.d., and morphine muriate 0.01 subcutaneously.

Jan. 26th. Temperature 8 A.M., 37°; noon, 36.3°; 4 P.M., 37°; 8 P.M., 36.4°. Jan. 27th. Temperature 8 A.M., 36.5°; noon, 36°; 4 P.M., 36.9°; 8 P.M., 36.6°.

Ophthalmoscopic examination. Left eye: Great retinal œdema. The margin of the papilla sharply defined only on its nasal side. No trace of hemorrhages. Exophthalmos still great, movements of the eye very limited and painful. Right eye: Exophthalmos and chemosis better. Patient can voluntarily raise the upper lid. Nothing of importance to be seen in the fundus except some hyperæmia of the papilla. Vision $\frac{4}{8}$. General condition also much better.

On Feb. 6th, when I next saw the patient, she was out of bed and feeling like herself. The retinal œdema of the left eye had decreased considerably so that the retinal vessels could be seen very well except in the lower-outer portion. The papilla was pale and sharply defined. No traces of present or past hemorrhages. The direct papillary reflex was extremely slow, while the consensual and accommodative reflexes were good. Central vision was lost, the peripheral reduced to qualitative perception of fingers at 50cm. The motor apparatus was not yet normal, but voluntary movements were no longer painful. The wound was clean and granulating. Only a slight degree of exophthalmos remained. The right eye still protruded slightly and its movements were somewhat restricted, but otherwise it was normal. Strychnine and electricity were prescribed in the hope of obtaining an improvement in the vision of the left eye.

Feb. 28th.—Left eye: Movements limited in all directions. Some injection of the conjunctiva. The direct pupillary reflex almost wanting with ordinary daylight, very slow with a 10-candle-power electric light. Optic disk pale, lamina cribrosa plainly visible, arteries and veins rather small. An irregular thin, gray band of retinal cloudiness, 2 p. d. wide in its middle, in the outer part of the fundus. Central vision lost. Right eye: Vision 1.

March 29th.—Left eye: Slight insufficiency of internal rectus.

Direct pupillary reflex and vision lost. Optic disk as before, rather small vessels, no retinal œdema, no traces of hemorrhages.

In Feb., 1898, the ophthalmoscopic condition of the left eye was as follows: Margins of nerve rather sharply defined, with a scleral ring to its outer side. Lamina cribrosa plainly to be seen. Veins small on the papilla, but apparently of normal size in the retina. Arteries $\frac{1}{3}$ to $\frac{1}{2}$ their normal size. In all parts of the fundus, but particularly below and to the nasal side, were broad white stripes with indistinct margins which corresponded in direction, course, and form to sclerosed choroidal vessels. Normal choroidal vessels could be seen here and there. In places heaps of pigment could be seen.

The patient died in 1899. No autopsy was allowed.

In this case we have a primary subcutaneous infection of traumatic origin at the external canthus of the left eye, which, without the formation of a true orbital abscess, produced inflammation of the orbital veins which extended as thrombophlebitis through the orbit toward the brain. The thrombosis of the left cavernous sinus passed to the right through the circular sinus, and the flow of blood through the right ophthalmic vein in the right orbit was finally stopped.

The ophthalmic veins are very tortuous, have no valves, are large, and have a very great collateral circulation. Normally the blood flows from before backward into the cavernous sinus, but Festal has shown that when the blood pressure in the sinus is increased its flow may be checked, turned forward, and directed through its anastomoses into the facial vein. When the anastomoses are insufficient, the veins become distended and transudation takes place into the cellular tissue of the orbit and so produces exophthalmos.

The affection began in this patient with a traumatism at the left outer canthus on Jan. 14, 1895. The next day there was lachrymation, inability to read well, and pain referred to the left eye and orbit. On Jan. 17th and 18th there was great pain in the orbit and in the left side of the head, associated with profuse perspiration. Apparently fever was present, but the temperature was not determined. On Jan. 19th and 20th, symptoms of intraorbital tension appeared, accompanied by excessive pain. Exophthalmos of the left

eye appeared on the morning of the 20th. The temperature was 39° , and the intraorbital tension reached its highest point. An œdematous swelling in the temporal region was noticed on the morning of the 21st. It was now certain that a severe infectious process in the orbit, associated with a high fever, had stopped the venous outflow and produced the œdema of the fatty tissue, chemosis, great exophthalmos, paralysis of the oculo-motor and other motor nerves, and the excruciating pain. It was not certain whether an abscess was present in the orbit or not, so an incision was made and two or three drops of pus were found deep in the orbit. The thrombosis of the ophthalmic vein had probably reached the cavernous sinus at this time, because on the 23d a swelling of the right upper lid was noticed, and on the afternoon of the 24th a marked exophthalmos of the right eye had developed, together with all of the circulatory and nervous disturbances present on the left side. Thus the venous obstruction had passed in two days through the left cavernous sinus, the circular sinus, the right cavernous sinus, and involved the right ophthalmic vein.

Unilateral exophthalmos would simply indicate thrombosis of the corresponding ophthalmic vein, but bilateral exophthalmos, when the thrombosing agent has not acted from the front on both orbits, must be due to thrombosis of both cavernous sinuses and occlusion of the veins of both orbits, hence the exophthalmos of the right eye, so great that the lids could not be closed over it, has a bearing on the diagnosis of the case far greater than such a symptom as a swelling of the right upper lid would have had.

During the first few days the pain was due to the local inflammation and the pressure of the orbital œdema on the filaments of the trigeminus. As the thrombophlebitis extended backward the pain increased, until it finally became extreme over the entire side of the head. At this time vomiting occurred, in all probability coincidentally with the thrombosis of the cavernous sinus, and the pressure on the nerves in and about this sinus explains the paralyses which now appeared and finally resulted in total ophthalmoplegia.

The circulatory conditions within the eyes and the oph-

thalmoscopic pictures presented during the attack and three years later are very interesting. At first nothing except rather large veins and an abnormal redness of the disk was to be seen in the left eye. These conditions became more marked every day until the margins of the papilla became obscure, and then an extensive œdema of the retina slowly developed, which was densest over its temporal portion, particularly below and outward from the papilla. At no time was there a choked disk, a thrombosis of the central vein, or hemorrhages in the retina. The right eye showed only large veins and a hyperæmic papilla after the exophthalmos had lasted two days, and there was only a slight, transient œdema of the retina.

A study of the anatomical conditions reveals that even when the cavernous sinus and the ophthalmic veins are occluded a considerable amount of the blood from the central retinal vein may escape through its anastomoses with other veins, and if the quantity of blood which enters through the central artery is reduced by the great increase of the intraorbital pressure it can be understood how this smaller quantity of blood may escape without inducing a choked disk. Hence the presence of a choked disk is not to be overvalued as a diagnostic indication of sinus thrombosis, or of thrombosis or thrombophlebitis of the orbital veins, while it is important as the almost constant accompaniment of brain tumors. The œdema of the retina, the redness of the papilla, and the indistinct margins of the latter are satisfactorily explained by the long-continued increase of intraorbital pressure and the compression of the vessels. The thrombosis or non-thrombosis of the central vein in such a case depends on the peculiar, variable anatomical conditions.

The vision of the eye first affected slowly passed away and did not return after the subsidence of the acute symptoms. That of the other eye fell to $\frac{1}{2}$ and later returned to 1, but the patient always claimed that her vision was not as good as it had been before the attack. The ophthalmoscopic picture of the left eye for three years after was that of a pressure atrophy of the optic nerve. The long-continued compression of the orbital vessels in and about the optic nerve had re-

sulted in exudation, interfered with nutrition, and produced atrophy.

The fever was of a slightly remittent character without the hectic type of certain septic fevers. The temperature curve was somewhat interfered with by administration of phenacetin, but resembled that of a staphylococcus phlegmon. The pulse, as a rule, corresponded to the temperature. The general condition of the patient was bad. The pain, which steadily increased until it became unbearable, stamped the disease as very serious. Vomiting occurred either as the result of the pain or as a symptom of cerebral irritation. The latter idea is favored by the great excitement of the patient on the afternoon of the same day. On the same day she passed into a state of apathy which increased to somnolence and persisted for four days. This apathetic somnolent condition corresponded exactly to the time of the exophthalmos of the second eye, when the sinus thrombosis had become perfected and the pulse and temperature indicated commencing intracranial pressure. As the exophthalmos of the second eye retrograded, the temperature and pulse became better and the general condition slowly improved.

The prognosis of infectious thrombosis of the cavernous sinus is extremely bad, and this case is unique as the first one recorded of recovery from thrombosis of both cavernous sinuses caused by infectious thrombophlebitis in one orbit with subsequent occlusion of the veins in the other. This recovery may be explained in three ways. We may assume that the purulent thrombophlebitis extended with its toxins and bacteria into the sinus and the other orbit, but was overcome in a peculiar manner by a rare vitality and power of resistance on the part of the phagocytes of the patient, and that the surgical procedures had little to do with the result; or that the infectious thrombosis advanced into the sinuses and the other orbit, and that the resistance of the normal tissues sufficed because the primary focus had been surgically removed at the right time so that subsequent impulses to the infecting material were prevented; or, third, that the purulent thrombophlebitis of the smaller veins of the left orbit was transmitted through the ophthalmic vein to the left sinus,

and that this resulted in the coagulation of the blood in the circular sinus, the right cavernous sinus, and the right ophthalmic vein without the presence of microbes or of their products, forming an aseptic thrombus. The last theory seems to the writer the most probable. At the same time he is strongly of the opinion that the timely opening of the primary focus of infection in the left orbit was of great importance in determining the recovery of the patient.

ABSTRACTS OF ARTICLES IN VOL. XLII. OF THE
GERMAN EDITION, 1900, NOT PREVI-
OUSLY TRANSLATED.

BY DR. MATTHIAS LANCKTON FOSTER, NEW YORK.

I.—EXAMINATION OF THE EYES OF 2500 WORKMEN IN VARIOUS
INDUSTRIAL PURSUITS. A CONTRIBUTION TO THE STUDY
OF INJURY TO THE EYES BY INDIVIDUAL TRADES.

BY DR. **WALTHER**, OF CHARLOTTENBERG.

THE result of the inquiry conducted by Dr. Walther with the assistance of Messrs. Overweg and Haselberg was that 611 out of 2672 workmen were found to have their vision more or less imperfect. In 387 the cause of the impaired vision was congenital, in 224 acquired. In 95 of the latter the occupation could be held responsible for the diminution of vision. The ratio of the congenital bad vision to the acquired was 63.3 to 36.6. 15% was due to occupation. There were 775 workmen under 23 years of age of whom 109 had impaired vision from congenital causes, 26 from acquired, 11 due to occupation. Here the ratio of the congenital to the acquired was 80.7% to 19.2%, only 8.1% due to occupation. With advancing age the number of persons with impaired vision due to occupation increased. In some callings injurious influences are present which gradually impaired the vision, such as the myopia developed among typesetters, gold-workers, carpet manufacturers, mechanic and allied trades, the injuries met with among metal workers, the conjunctival catarrh of cabinet-makers and furniture polishers, and the dazzling of glass-cutters, even though the diminution of vision might be only transient.

Not a single case of contagious disease was met with.

Nine workmen were met with who had been blinded or had lost an eye as the result of injury due to occupation.

II.—SARCOMA OF THE CHOROID WHICH RESULTED IN PHTHISIS BULBI.

BY DR. **HEINRICH SCHULTZ**, OF BERLIN.

Anna G., twenty-six years old, sought relief Feb. 18, 1899. The patient, who had always enjoyed good health, noticed during the summer of 1898 a shadow which gradually increased in size before her right eye. Toward the end of the year the eye became almost totally blind within a few days. It had received no injury, was neither inflamed nor painful, and the condition had since then remained unchanged.

Feb. 18, 1899.—Right eye: Excentric vision, counts fingers at $\frac{1}{4}m$ toward the outer side. Inner and upper part of visual field defective. Emmetropia. Eyeball normal externally. Detachment of the retina to the outer side and below, extending close to the papilla, sharply defined and abrupt. No undulation or folding of the detached retina to be seen. Tension normal. Left eye normal with perfect vision. Diagnosis: subretinal tumor. Treatment: KI and sweating. Patient kept under prolonged observation.

The detachment gradually increased in height and breadth, and in the early part of March presented extensive subretinal hemorrhages which gradually extended and rendered the diagnosis of a tumor still more probable. After some weeks the treatment was discontinued as useless. The vision fell to movement of the hands excentrically outward. Enucleation was declined and the patient returned home about the end of June.

On July 25th, while the patient was at work in the field, a severe inflammation of the right eye set in with intense pain without any external cause. It was treated with leeches, ice, and drops. On Aug. 14th, she returned to the clinic. The lids of the right eye were still red and swollen; there was a moderate exophthalmos, chemosis, hyphæma, great injection of the globe, minus tension, and tenderness to pressure. Vision was lost. The patient stated that the redness and swelling of the eye as well as the pain had decreased considerably, although there were still occasional attacks of severe pain. Atropine, cocaine, and warm applications were ordered. The inflammatory symptoms gradually

subsided until on Oct. 2d they had disappeared together with the attacks of pain. The globe was much shrunken, soft, and tender. The cornea was depressed and cloudy. Nothing could be seen of the iris or pupil. Enucleation was performed Oct. 3d. The globe was adherent in many places to Tenon's capsule. No recurrence in the orbit as late as April, 1900. Left eye remained sound.

The macroscopical examination showed that the greater part of the posterior segment of the eyeball was occupied by a tumor which measured 7mm in its longest diameter. The microscopical examination revealed atrophy or great degenerative changes of all the tissues of the eyeball, with the exception of the lens, and an almost totally necrotic round-cell sarcoma of the choroid. No micro-organisms were present in the eye.

III.—POSTOPERATIVE CONJUNCTIVITIS AND ITS BACTERIOLOGICAL CONDITION.

BY DR. G. ABLESDORF AND DR. NEUMANN.

Three cases of extraction of senile cataract. In the first the anterior chamber failed to re-form, and a severe reaction with a considerable quantity of grayish-yellow mucous secretion was noted on the fifth day. The treatment instituted consisted of atropine, sublimate cleansing, and $\frac{1}{4}$ % zinc, with a bandage at night. Fourteen days later there was still no anterior chamber and the iris had begun to prolapse. This prolapse of iris was abscised three days later. After the lapse of two weeks the anterior chamber was of normal depth. The inflammation and secretion persisted until the patient passed from under observation on account of pneumonia, about two months after the operation.

In the second case the incision had closed and the anterior chamber re-formed two days after the operation. There was only a slight ciliary injection, but a severe inflammation of the conjunctiva was present with an abundant mucous secretion. The treatment instituted was scopolamine, $\frac{1}{4}$ % zinc, cleansing with sublimate, and a bandage at night. The case progressed very favorably, and was discharged twenty-seven days after the operation on the first eye, sixteen days after the operation on the second.

In the third case the first cataract was extracted without

the production of any bad symptoms. The second cataract was removed eleven days later, and this operation was followed by a violent attack of inflammation associated with a very abundant secretion.

In each case diplococci were found in the conjunctival secretion which were identified as the *diplococcus albicans tardissimus*.

IV.—A STEREOSCOPIC OPHTHALMOSCOPE.

By Dr. **WALTER THORNER**, OF BERLIN.

This article must be read in the original.

V.—SUBCONJUNCTIVAL INJECTIONS WITH ACOIN.

By Dr. **G. HIRSCH**, OF HALBERSTADT.

The most important property of acoin is that of subconjunctival anæsthetization. Hirsch details his experiences with it in connection with injections beneath the ocular conjunctiva of solutions of cyanate of mercury, 1:2000 and 1:3000, for irido-cyclitis, threatened panophthalmitis, and parenchymatous keratitis, as well as injections of a 5 % salt solution for detachment of the retina, removal of remains of cataract after the operation for myopia, and for fluid vitreous. In all of these cases the injections were painless.

VI.—CONTRIBUTIONS TO OPHTHALMOLOGY.

By Dr. **G. VINCENZ FUCALA**, OF VIENNA.

The first part of this article is devoted to Averrhoes, who is said to have been the first to recognize the retina as the portion of the eye which was sensitive to light. The second part is devoted to the history of belladonna and mydriatics, which are said to have been introduced into ophthalmic practice by Richter in 1785, but according to this author belladonna had been known and used from the most ancient times under the name of mandragora.

VII.—TWO CASES OF SYPHILITIC PAPULES ON THE OCULAR CONJUNCTIVA.

By Dr. **RUDOLF SCHREIBER**, OF VIENNA.

CASE 1.—Woman forty-five years old, entered hospital April 12, 1900, with extensive venereal gangrenous sclerosis of and

about the vulva, ulcerated papules in the genito-crural fold and on the buttocks, ulcerated patches on the lips, and eczema of the hands and forearms.

Toward the end of April she complained of a burning and itching in her left eye. On the ocular conjunctiva above the cornea there was a circumscribed place with distinct conjunctival injection, which a few days later developed into a nodular efflorescence as large as a hemp-seed, grayish-white in color. On May 14th, there was an ulcer at the inner canthus of the left eye, covered with a scab. The outer parts were normal, the lower palpebral conjunctiva pale. Along the margins of the upper lid were three little ulcers with lardaceous coatings and the conjunctiva was red. The ocular conjunctiva was pale, except above, where there was a very circumscribed conjunctival and dusky ciliary injection. In this region, about $\frac{1}{2}$ cm above the corneal margin, was a grayish-yellow nodule which protruded from the conjunctiva, with a lardaceous covering on its surface and presenting no signs of degeneration. The injection was confined to vessels arranged concentrically about this nodule. The only subjective symptom was a slight feeling of the presence of a foreign body, which caused no trouble or irritation. The cornea, globe, and fundus were normal. The papules disappeared after the patient had been placed on general treatment.

CASE 2.—Woman, twenty-one years old, who had suffered when a child from inflammation of the eyes, probably from eczematous conjunctivitis. When she came under treatment, April 23, 1900, she had eroded papules on her external genitals, the left angle of her mouth, and in her nostrils. On the lower lid of her right eye at the inner canthus was a small purulent ulcer which slightly involved the upper lid. It was not painful and caused no signs of irritation. Eight days later there were in the ocular conjunctiva, some at the limbus and some at a distance from it, grayish-white nodular infiltrates with circumscribed conjunctival injection. The next day these had increased in size and new ones had appeared. On May 14th the condition of the right eye was as follows: Moderate photophobia, palpebral fissure narrowed. At the inner canthus, mainly on the upper lid but involving a small part of the lower, there was a shallow, sickle-shaped ulcer with grayish floor and margins. The conjunctiva of both lids was red. The plica semilunaris and the conjunctival fold were greatly swollen. The peripheral parts of the bulbar

conjunctiva were slightly swollen, with marked conjunctival and slight ciliary injection. The portion about the cornea for a breadth of about 5mm was swollen, brawny, and deeply injected, particularly in its lower part. In this were seven nodules varying in size from that of a hemp-seed almost to that of a lentil. The nodules protruded plainly from the surface of the conjunctiva and were of a grayish-white or a grayish-yellow color. The epithelium of most of them were eroded at their apices, and the one at the outer limbus, which partially involved the cornea, was ulcerated, the base of the ulcer grayish-yellow and brawny. The cornea appeared to be normal, with the exception of central maculæ, to which superficial vessels extended. The anterior chamber was of normal depth, the iris and fundus normal. The right preauricular gland was indolently enlarged; the left eye was normal.

The treatment of the syphilis was local at first, but on May 16th general treatment was instituted, which brought the eye back to its normal appearance in about a month.

VIII—PATHOLOGICAL ANATOMY OF SECONDARY GLAUCOMA AFTER SUBLUXATION OF THE LENS.

By DR. G. ISCHREYT, OF LIBAU.

The eye was that of a man fifty years old who had received a blow on his right eye about a year before. It was enucleated because of glaucoma.

The eyeball, which was somewhat pyriform from distention of the cornea and neighboring sclera, was placed in weak formol, hardened in alcohol, and embedded in celloidin.

The ocular conjunctiva was thickened, its veins dilated, the arteries of fairly normal calibre with occasional thickening of the intima, its tissue infiltrated with mononucleated round cells, especially near the veins. The infiltration was greatest in the subepithelial zone. Numerous round cells lay between the epithelial cells.

The epithelium of the cornea was thicker than normal, irregular, and contained round cells. Beneath it was a marked round-cell infiltration which involved Bowman's membrane and the upper layers of the parenchyma. From the limbus to the region of the apex of the cornea there were numerous

vessels, chiefly in the middle layers of the parenchyma. The round-cell infiltration was most intense about the dilated vessels. Pigment was present in places in the stroma. Descemet's membrane was very thick. The endothelium was irregular, in places the cell nuclei were badly stained, in other places the cells were absent. In many sections pigment deposits were seen in the endothelium.

The endothelium of Descemet's membrane was continuous with that of the iris, and the membrane itself extended as a hyaline-like layer between the endothelium and the subjacent membrane of the iris, decreasing in thickness as it approached the pupil until it disappeared.

The anterior part of the sclera was greatly stretched; back of the ciliary body it was of normal thickness and appearance. The groove between cornea and sclera was gone. The distention was uniform, the thickness of the sclera varying from 0.22 to 0.35 mm. It was infiltrated with mononucleated round cells. The peripheral part of the iris was adherent to the sclera. The normally narrow spaces for the passage of vessels were much broadened, a change which seemed to have been followed by an œdematous fluidity. The scleral veins were dilated; the arteries were mostly of normal calibre, with occasional thickenings of the intima. A large episcleral artery exhibited marked changes; its round lumen lay excentric in its large oval sheath.

The iris was atrophic, especially at its root, and had a firm fibrous structure with few vessels. The latter were partly obliterated, partly had thickened walls. These changes affected particularly the arteries; the veins for the most part had thin walls and were dilated. The pigment layer was irregular, with many heaps of pigment in the stroma.

An exact determination of the position of the plexus venosus ciliaris and Fontana's space was impossible on account of the greatly distended condition of the cornea and sclera.

The ciliary body was atrophic and infiltrated with round cells, the processes atrophic, a portion having undergone connective-tissue degeneration. The pigment epithelium was very irregular. The vessels were in all conditions from that of great distention to that of complete obliteration.

The lens was dislocated upward and outward.

The vessels of the choroid were well filled, the veins greatly distended. Some degenerative changes were present in the retina, but there were no signs of the presence of inflammation. Proliferations of the intima, which in places reached a high degree, were present in the posterior ciliary arteries.

REPORT OF THE MEETINGS OF THE OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

By C. DEVEREUX MARSHALL.

CLINICAL EVENING, THURSDAY, FEBRUARY 8, 1906. CHARLES OLDHAM, F.R.C.S., VICE-PRESIDENT, IN THE CHAIR.

Messrs. ARNOLD LAWSON and GEORGE COATS showed preparations from a case of **congenital anterior staphyloma** previously brought before the Society by Mr. Lawson. The eye had spontaneously ruptured six weeks later. The central portion of the cornea was thinned and had a cicatricial appearance. The cornea was perforated with a knuckle of retina caught in it. The lens capsule and iris were adherent to the back of the cornea. Owing to stretching the ciliary processes, the pars plana, ora serrata, and anterior part of the choroid were carried forwards with the cornea. Owing to the firmer attachment of the ciliary body to the sclera, this had been left in its normal position. Thus the ciliary processes were farther forwards than the termination of Descemet's membrane, and the ora serrata was actually in front of the ciliary muscle.

Only *one other case of the kind has been described*, also in a similar case to this one. The reason of this displacement was due to the fact that in foetal life the inner layers of the uvea were less intimately connected with the outer than is the case after birth, and the same occurs in many of the lower animals, especially in birds. The staphyloma in this case was believed to be due for certain to intrauterine inflammation and perforation of the cornea.

Mr. HOLMES SPICER showed a patient aged forty-eight who had always been **short-sighted**. The left eye had been blind ever since an injury he had received thirty years ago, and the right eye failed in 1901, and now had total posterior synechiæ and no P.L. The left eye had a corneal opacity and tremulous iris; the

lens was tilted and slightly dislocated backwards; it was quite opaque, and there was no fundus reflex. The vision was P.L. and the projection was good. On March 3, 1903, a needle was introduced behind the ciliary body, and the lens was pushed backwards. The sight was at once obtained, and it had since improved so that he was now able to see $\frac{6}{80}$. There was a large area of myopic atrophy of the choroid about the disk, and the shrunken lens was visible at the bottom of the vitreous.

Mr. Spicer also showed a case of **superficial punctate deposit on the cornea**. The patient was a girl aged sixteen, whose right eye was attacked with interstitial keratitis in 1897. She became deaf in 1902, and she had an attack of interstitial keratitis in the left eye in 1905. The latter was severe and led to much opacity and to the development of salmon patches in two places, and a deposit of keratitis punctata at the back of the cornea. The left cornea had cleared considerably; there was some deep opacity near the centre, and numerous small brown or dirty-white dots exactly like keratitis punctata, but they were evidently close to the surface, and in front of the old interstitial opacity.

Mr. LUDFORD COOPER showed a girl aged eleven, suffering from **elephantiasis neuromatosis**. There was much deformity of the right upper eyelid and temporal region. The lid was pendulous and all its structures were greatly hypertrophied. The lid was also considerably everted. The patient was unable to lift it, and it could with difficulty be raised so that the small shrunken globe beneath it could be seen. The lens was opaque and the tension was normal. The outer and lower portions of the frontal bone and of the squamous portion of the temporal bone were much more prominent on the affected side. The condition was congenital and was slowly increasing.

Mr. E. E. HENDERSON showed a woman aged twenty-nine who had a growth on the upper palpebral conjunctiva. For several weeks she had noticed something movable beneath her upper lid, and for three days it had protruded. An oval mass was found about 2.5 cm long and 1 cm broad. Its surface was smooth and vascular, and was attached to the fornix by a strip of conjunctiva containing vessels. It was thought to be tubercular.

Mr. SYDNEY STEPHENSON showed a boy aged nine who had **two detachments of the retina in one eye**, one above and the other below. The tension was increased, and the vision was bare P. L. Transillumination showed that light passed readily through both

detachments. The other eye was myopic, with some vitreous opacities. There was an obscure history of injury, and a doubtful history of tubercle in the family. The question was one of diagnosis, though it was considered to be of a tubercular nature by Mr. Stephenson.

Mr. H. H. B. CUNNINGHAM showed a girl aged five whose sight was noticed to be defective at school. In both eyes the **lenses were displaced**, most marked in the right eye; the suspensory ligament was absent below. There was no coloboma in either iris or choroid. The right eye was myopic about 8D, and the left about 3D, but with some astigmatism in both.

Mr. A. STANFORD MORTON showed the drawing of a case of **staphyloma posticum verum** (Weiss).

Mr. TREACHER COLLINS showed two cases of **congenital coloboma of the iris with a bridge**. In the first case there was a bridge of pigmented iris tissue about 1 mm in breadth, stretching across the space formed by the pupil and the coloboma. It was situated a little below the level of the margin of the pupil, which was pear-shaped with the small end downwards.

In the second case the two eyes presented two lesser degrees of the same condition. In one eye the stroma of the iris was alone deficient below the bridge, the pigment epithelium being left exposed. In the other eye, the space below the bridge formed in part a complete gap in the iris, and was in part filled with pigment epithelium. The developing iris receives its blood supply from two sources: (1) loops of vessels budding off from the anterior ciliary arteries, and (2) branches continued forwards round the sides of the lens from the central hyaloid artery; these form a circle of anastomosis anteriorly. The gap in the iris peripherally in these eyes might be explained by the failure in formation of one of the loops from the anterior ciliary arteries; and the bridge, by the normal formation of the anterior circle of anastomosis from the central hyaloid artery.

Mr. ARNOLD LAWSON showed a case of **persistent œdema of the upper eyelids** in a girl aged twelve. The affection commenced about six years ago, shortly after recovery from an attack of measles which ran a normal course. Both upper lids were much swollen and drooped over the eyes, almost obliterating the palpebral fissures. The skin and subcutaneous tissue were not at all altered, and the state of the general health had much to do with increasing or diminishing œdema. The condition was strictly

limited to the upper lids, and but for its weight it did not cause any inconvenience.

Mr. LAWSON also showed a case of **concomitant divergent vertical strabismus**, with associate movements of the lids. The squint had existed since early infancy. The right eye was always used for fixation, and the left was divergent, and on a lower level than its fellow; the upper lid drooped over it so that it almost concealed the cornea from view. On screening the right eye, the left quickly moved upwards and inwards to the position of normal fixation, and the lid was correspondingly elevated. Behind the screen, the right eye deviated upwards and outwards, and the upper lid was strongly retracted. On removing the screen, the left eye and lid once more dropped to their former position. On asking the child to look upwards, the movement of the left was seen to be defective, and on attempting to look downwards, the movement of the right eye was seen to be less than the left.

THURSDAY, MARCH 8, 1906. PRIESTLEY SMITH, F.R.C.S.,
PRESIDENT, IN THE CHAIR.

Messrs. J. HUBERT PARSONS and GEORGE COATS read a paper on a case of **orbital encephalocele** associated with microphthalmia. Mr. Parsons had shown the child to the Society when thirteen weeks old. There were then large cyst-like masses in the right orbit pushing the globe over the outer side. The right eye was evidently microphthalmic and showed ophthalmoscopically a coloboma of the nerve entrance and also of the macula. Various diagnoses were made as to the orbital condition. As the tumor was increasing in size it was operated on, but the child died a few days later. The mass in the orbit consisted of brain tissue which pressed upon and caused deformity of the globe. It was connected with a large mass of brain substance within the skull which lay beneath the frontal lobe. The intracranial mass had displaced the latter upwards and the temporal lobe backwards, but had no connection whatever with either. It was therefore believed to be either a teratological inclusion, or a piece of brain substance snared off in early foetal life, possibly from the region of the caudate nucleus, and growing independently.

The eye showed three deformities, each of which was rare: (1) An ectasia on the nasal side of the papilla, which still had a lining

of stretched choroid and normal retina. (2) A coloboma of the nerve entrance which was peculiar in being on the temporal side of the nerve and in being entirely within the area of the porus opticus. (3) A macular coloboma which consisted chiefly in a partial defect and depigmentation of the pigment epithelium, both the choroid and retina being almost intact. The relation between the encephalocele and the abnormalities of the globe was discussed.

MR. PRIESTLEY SMITH described a **scotometer** for the diagnosis of glaucoma and for other purposes. It was intended to facilitate the examination of the central parts of the field of vision, especially in cases of suspected glaucoma. It consisted essentially of a disk of millboard covered with black cloth and figured on the back with the degrees of the circle. The test object was a small cutting of gray wool which was laid upon the cloth at any desired distance from the centre. In the case of suspected glaucoma it should be placed at 25° from the centre, as shown by a faint mark on the cloth, and the disk should then be slowly rotated. Should it nowhere disappear or grow dim, in all probability glaucoma does not exist, for, as Bjerrum had shown, the defect in the glaucoma field was almost always radial or sector-like, and, with a delicate test, could be traced inwards. If a defect were found, its extent should be noted on the graduated circle so that it could be used for future comparison. Other circles could be explored if necessary. The authorized maker of the instrument is Mr. Bailey, of Bennett's Hill, Birmingham.

MR. C. WORTH read a paper on **hereditary influence in myopia**. Though often regarded as a simple error of refraction, grave complications may arise which altogether overshadow the original condition. Myopia is frequently inherited. In a series of 687 cases examined by the author, 33 were malignant and 654 were uncomplicated. Of the latter, 56 % gave a family history of myopia, while in the former in only 24.25 % was evidence of heredity found. In one family whose pedigree was shown, nearly all the males were myopic and none of the females; but the myopia was transmitted through the female line. The amount was, in all cases examined, about the same, viz: 10 to 12D with some astigmatism. The fundi showed crescents, but grave complications were wanting. Curiously enough in this family all the healthy eyes were blue, and all the myopic ones were brown. Night blindness was only admitted in one family.

The statistics of the 687 cases were as follows: Of 313 with no family history of myopia, 163 were males and 150 females. Of 374 with a family history of myopia, 228 were males and 146 females. This showed that the usual preponderance of myopia in men was increased in those in which myopia was hereditary.

Of the 374 cases in which a family history of myopia was obtained, in 159 the parents were myopic, but the myopia was present in uncle, aunt, or grandparent. The fault was on the mother's side in 104 cases, on the father's side in 33 cases, and on both sides in 22 cases.

REPORT OF MEETINGS OF THE OPHTHALMOLOGICAL SECTION, NEW YORK ACADEMY OF MEDICINE.

By DR. H. W. WOOTTON, SECRETARY.

MONDAY, JAN. 15, 1906. DR. W. B. MARPLE, PRESIDENT, IN THE CHAIR.

Dr. W. B. MARPLE was re-elected Chairman.

Dr. H. W. WOOTTON was re-elected Secretary of the Section for the ensuing year.

Dr. ALEXANDER DUANE presented an **apparatus for accurately plotting central scotomata, the field of fixation, and the field of single vision.**

It consisted of a curtain 64 inches high and 54 inches broad, mounted on a light portable frame like an ordinary screen. The frame was made so as to be taken apart readily, and the curtain could be raised or lowered through a distance of ten inches. One side of the curtain was white and marked like an ordinary perimeter chart with circles and radiating lines, the circles representing 5° intervals on a tangent scale, calculated for a radius of 30 inches. The scales extended upward 36° , downward 53° , and laterally 42° . The other side of the curtain was dead black and marked only by the white head of a pin thrust through it to show where the centre of the perimeter chart on the reverse side lay. The patient being seated opposite the black surface, and just 30 inches from it, the curtain was raised until the pin was on a level with the eye.

The outlines of scotomata, the points where double vision began, or the limits of the excursion of the eye in any direction, could then be pricked off by pins, whose position, as they stuck through, was shown on the perimeter chart on the other side. A plot like this could be quickly made—more quickly than with an ordinary perimeter—and could be readily transferred to a perimetric chart. The apparatus was particularly useful in

plotting the field of double vision, in which case the amount as well as the location of the diplopia could be indicated by inserting two pins of different colors, one marking the site of the test-object, the other the site of the corresponding double image. In delimiting the field of fixation it was sometimes necessary to extend the limits of the scale laterally. This was done by a tape with a tangential scale marked on it, which carried the field out to 60° on either side.

Dr. E. COBURN suggested that when the pins in Dr. Duane's apparatus were carried through to the other side the field would be reversed, and this might cause confusion.

Dr. DUANE admitted that this was a defect, but stated that in registering his results on charts he always indicated the nasal and temporal limits. He preferred a tangential scale to the scale represented by the arc as on perimetric charts.

Dr. THOMAS R. POOLEY presented a case of **cilia in the anterior chamber**. The patient had been injured three weeks before. There was an incised wound on the nasal side of the cornea, in its vertical meridian, which had nearly healed. The eye was free from irritation, the lens uninjured, V. good. By oblique illumination two lashes were to be seen in the anterior chamber. One extended across the chamber in its vertical meridian on the temporal side near the ciliary attachment of the iris. The other, a much shorter one, had one end engaged in the corneal scar, from which it projected in the anterior chamber in its horizontal meridian. As the eye was free from irritation, it was decided to let them alone.

Dr. J. E. WEEKS presented a case of **fistula of the cornea successfully closed by a plastic operation**.

Dr. E. L. OATMAN presented a case of **melanosarcoma of the choroid with recurrence in the orbit after enucleation**. Published in full in this number of these ARCHIVES, pages 318-320.

Dr. FRANCIS VALK presented a case of **formation of the conjunctival cul-de-sac** according to the method of Dr. Weeks.

The patient met with an accident from fireworks, in which the stick of a rocket, coming down, tore out the eyeball and lower cul-de-sac of the conjunctiva, so that she was unable to wear an artificial eye. Two months ago he performed the operation for the formation of a cul-de-sac according to the method of Weeks, by attaching the Wolf's graft obtained from the arm to the perios-

teum of the outer edge of the orbit and the insertion of a rubber plate. She now has a good cul-de-sac and wears an eye with comfort.

Dr. S. PAYNE presented a case in which **enucleation had been followed by the insertion of a paraffin ball into Tenon's capsule.** The muscles had been sutured over this. The operation had been performed about a year ago. Cosmetic result was excellent and the movements extensive.

In the discussion which followed, Dr. DE SCHWEINITZ stated that he had seen a case similar to that of Dr. Pooley, in which the cilium had been in the anterior chamber for six months. It was removed to prevent formation of a pearl cyst. The cilium when removed was normal. He advised removal of the cilia in Dr. Pooley's case.

Dr. E. S. THOMSON had seen a case in which, three months after the injury, two cilia were observed partially within the anterior chamber. The cilia were removed. He believed that pearl cysts would have formed.

Dr. E. L. OATMAN stated that the removal of cilia from the anterior chamber does not always prevent the subsequent development of pearl tumors or cysts. These tumors develop from the epithelium of the root sheath, which may remain implanted in the iris after the eyelash has been removed.

In the discussion of Dr. Oatman's case of melanosarcoma, Dr. MARPLE stated that he had seen a similar case in which the evisceration had been followed by no recurrence, the operation having been performed over a year ago.

In reference to Dr. Valk's case, Dr. WEEKS stated that a flap without a pedicle would shrink for from two to three and a half months. The condition remaining at the end of about three months was permanent. Anchoring the flap to the periosteum gave the best results.

In regard to Dr. Payne's case, Dr. J. H. CLAIBORNE stated that some years ago he had experimented with various substances in Tenon's capsule. The result in Dr. Payne's case was excellent. Time alone could show what the permanent result would be. On account of the variation of the size of the pupils caused by the stimulus of the light, he thought that the cosmetic effect in these cases might be very much enhanced if the patient were to have two artificial eyes, one for use at night, and the other to be used in the day.

Dr. MARPLE had seen two paraffin balls come out, but others had stayed in.

Dr. G. E. DE SCHWEINITZ read a paper entitled **concerning the value of the visual field phenomena in the investigation of certain neuroses and psychoses.**

In the discussion which followed, Dr. T. R. POOLEY thought that a number of control examinations were necessary in these cases, and asked whether Dr. de Schweinitz had found unfavorable after-results in any of these hysterical patients. As far as he knew, no amblyopia had resulted, but it does seem incredible with such contraction of the field as is often found.

Dr. E. COLLINS stated that neurologists were uniform in their opinion in regard to the limitation found in grand hysteria and neurasthenia. In his experience these limitations occurred in only thirty per cent. of the cases. This, however, was frequently enough to give it a permanent place in the symptomatology. This being granted, what was the prognosis of the cases? Were they necessarily very severe? Did the condition persist in any degree after the hysteria disappeared? The fatigue field of hysteria seemed to him to vary so very much in the same patient at different times that one could not place as much reliance upon it as upon the contracted field of hysteria.

Dr. W. L. LEZYNSKY agreed with Dr. Collins particularly in regard to the variability seen from day to day. He thought the fields as usually taken were all very unreliable. In hysteria the concentric contraction of the field, when well marked, was about the last symptom to disappear.

Dr. DUANE stated that cases with central scotomata were often very puzzling, and one might sometimes consider a case as functional when in reality it was not so.

Dr. G. E. DE SCHWEINITZ, in closing the discussion, admitted that the field symptoms were not present in all cases, but in the twenty-five or thirty per cent. in which they were present they were a fair symptom of hysteria and an aid to diagnosis. As to the permanency of the contraction of the field of hysteria, he thought that this condition might disappear promptly when the patient recovered. It might also disappear slowly or endure for a very long time, for months, just as was the case with the three types of hysteria amaurosis.

MONDAY, MARCH 19, 1906. DR. DUANE, CHAIRMAN PRO TEM.

Dr. H. H. SEABROOK presented a case of **hyperphoria with lateral curvature of the spine.**

Dr. Seabrook stated that 20 per cent. of our refractive cases have hyperphoria and most of them throw the head toward one or the other shoulder upon fixing objects, with a curvature of the upper portion of the spinal column away from the direction of the tipping of the head.

Bad adjustment of desks in schoolrooms with regard to sunlight was another cause, while oblique parallel astigmatism of the eyes, or oblique astigmatism of the aiming eye, was comparatively unimportant as regarded lateral curvature. The aiming or predominant eye was well studied by Kaiser in 1869, and its consideration was of interest, as Dr. Seabrook had found no mention in literature of the connection between hyperphoria and lateral curvature, except a casual mention of the matter by himself in 1900. The patient whom he presented had marked deformity from about two degrees of hyperphoria. Dr. T. Halstead Myers had examined the patient and found fixed curvature in the lumbar region and much plastic curvature higher up. A tenotomy of the left superior rectus sufficient to correct the hyperphoria had resulted in causing the head to be held in a perfectly erect position, while the curvature of the upper portion of the spine (cervical and thoracic), formerly so apparent, was now not noticeable to the ordinary observer, although the patient was nearly twenty years of age.

Dr. FRANCIS VALK thought that Dr. Seabrook's case was one in which lateral curvature of the spine might very well take place.

Dr. ALEXANDER DUANE thought that wry neck and probably scoliosis could be produced by the tilting of the head by the patient to bring the hyperphoric images on a level. It could readily be found that normally, when there is homonymous or crossed diplopia, tilting of the head and one shoulder always depressed the image on that side, whether that image belonged to the right or the left eye of the patient.

Dr. EDGAR S. THOMSON presented a specimen of **carcinoma of choroid.**

The patient, a woman of forty-eight years, first came under the care of Dr. Dean Foster in February, 1904, with failing vision in the right eye. Three years previously she had had the right

breast removed. It was examined and found to be scirrhus carcinoma. The vision was at this time $\frac{3}{80}$, and there was a cloudy spot on the retina on the nasal side of the disk. Dr. Thomson saw the case in consultation a week later, when there was a flat and slightly nodular growth beneath the retina. The retina was seen best with + 5. A diagnosis of metastatic carcinoma was made and enucleation advised. On May 5th the tension became elevated and the patient had attacks of pain which gradually grew worse until July 13th, when Dr. Foster enucleated the eye. The patient lived until Feb. 23, 1905. There was an autopsy. The specimen showed the usual appearance in such cases. The retina was detached and the choroid was extensively involved by the growth. There was beginning infiltration of the optic nerve.

Dr. DIXON stated that he had recently seen a case in which the eye had been removed for supposed sarcoma which ultimately proved to be carcinoma. The invasion had taken place on the temporal side of the choroid. The patient died later of carcinoma of the lung which had not been suspected.

Dr. OATMAN said that a peculiar feature of this case was the large size of the extraocular deposits as compared with those in the choroid. The entire nerve substance was replaced by carcinomatous tissue continuous with that in the choroid. He knew of no case of carcinoma of the choroid in which the malignant embolus was first deposited in the optic nerve. The possibility of such an occurrence was merely suggested in this case by the disproportionate size of the nerve deposit. An embolus could lodge in a nerve branch of the arteria centralis or in one of the branches from a short ciliary artery which goes to the nerve.

Dr. GEORGE DIXON reported, for Dr. R. G. Reese, a case in which a broken glass Mules ball had been worn for thirteen years and then removed. The skiagraph of the broken ball in the orbit was shown. In February, 1906, the patient had gently wiped the eye and broken the glass ball. Dr. Reese removed the broken glass and inserted a paraffin ball.

The skiagraph made by Dr. Dixon showed the crack in the glass.

Dr. E. S. THOMSON had often wondered why this accident did not occur more frequently, and this case was certainly one in favor of the use of paraffin. With paraffin, if a ball proved to be too large at the time of insertion, it could be reduced in size later, and the tissues again sutured over. In Dr. Reese's case the glass ball was certainly very thin.

Dr. LINN EMERSON thought the strength of the glass ball should always be tested before insertion.

Dr. DIXON stated that he did not think that the glass had eroded in this case thus making the ball more liable to fracture, but thought that the ball had simply been a thin one at the time of insertion.

Dr. OATMAN favored the insertion of a paraffin ball in Tenon's capsule.

Dr. F. J. PARKER reported a case of **quinine amaurosis**. The patient, a male, forty-three years of age, was admitted to the Presbyterian Hospital on June 4, 1905, in a condition of stupor, irregular respiration, flushed face, occasional periods of collapse. The following history was obtained: The man had been sick with broncho-pneumonia, and on the physician's order had taken 48 five-grain capsules of quinine (total 240 grains) in twelve hours during the night of June 3d. The next morning he had delirium, noises in ears, loss of sight. When examined by Dr. Parker on June 8th, the pupils were widely dilated, no reaction to light, cornea hazy and markedly hyperæsthetic; tension — 2, each eye; perception of light only. Fundus of right eye: nerve pearly white. Choroidal reflex very pale; thrombus inferior branch central vein; veins much enlarged, endarteritis of arteries, obliteration small branches, blood column broken in some branches resembling the condition in embolism. Iris dull. Left fundus same except thrombus was of superior vein.

The patient was put on hyp. strychnine $\frac{1}{80}$ once a day; increase $\frac{1}{60}$ each day to $\frac{1}{40}$. Amyl nitrite 2mm pearls t. i. d.; nitro-glyc. $\frac{1}{16}$. q. 4 hr.

A gradual improvement in appearance and vision. The patient left the hospital on June 30, with $\frac{3}{8}$ V R and L. Choroid reflex normal, circulation restored in large arterial branches, small arteries remained obliterated. Fields much contracted.

	R.	L.
Superior,	10 deg.	10 deg.
Inferior,	30 "	32 "
Nasal,	18 "	30 "
Temple,	20 "	30 "

On October 18, 1905, the vision R and L was $\frac{1}{16}$; slight increase of fields; fundus condition the same; nerve white.

Dr. LINN EMERSON read a paper entitled **some observations**

on Worth's methods of treatment of convergent squint, with presentation of cases. The following is the author's abstract :

The paper considered only concomitant convergent squint. Donders's epoch-making discovery of the causal relation of hyperopia and hyperopic astigmatism ; Landolt's remark in the early eighties that there is, with the majority of those who squint, a predisposition to strabismus with whose exact nature we are not yet entirely acquainted ; Worth's contention that the one true and prime cause of squint is deficiency or absence of the fusion sense. Predisposing causes are :

1. Hyperopia and hyperopic astigmatism.
2. Anisometropia.
3. Specific fevers, especially whooping-cough, measles, diphtheria, etc.
4. Violent mental disturbances (fright, fits, etc.)
5. Injury during birth.
6. Heredity.
7. Congenital defects.

Belief that congenital amblyopia is a very rare condition. Figures taken from Worth to show what occurs when fusion takes place ; early development of squint, 60% before fourth year and 90% before the sixth year. Fusion faculty seldom develops after the sixth year. There are three grades of fusion.

1. Simultaneous macular perception.
2. True fusion with some amplitude.
3. Sense of perspective.

Alternating squint is not as amenable to treatment as the monolateral cases. The squinting eye almost invariably has the higher refractive error. Plan of treatment:

1. Optical correction.
2. Occlusion of the fixing eye.
3. Use of atropin in fixing eye.
4. Training of fusion sense.
5. Operation.

Full correction under atropin as indicated by retinoscopy. Transfer of squint to sound eye in cases where atropin has been used for a long time without proper supervision. Training of fusion by amblyoscope, stereoscope, and plastograms. Credit is to be given to Dr. Bloch for pioneer work done in this country. The treatment of a case may extend over several years. This

plan of treatment in no wise interferes with or precludes operative treatment later.

After having the case under observation for a suitable time, the surgeon may perform:

1. Simple tenotomy on one or both eyes.
2. Tenotomy and advancement on one.
3. Panas's operation of stretching and treating, or both.
4. Advancement of one or both.
5. Some one of the various tucking or folding operations.

Panas's operation as a routine procedure is poor surgery. He prefers the advancement operation of Dr. Wootton.

There is opposition from the medical profession, and even from ophthalmologists to this plan of treatment. And much less opposition now than formerly, however. The parents are more sanguine as they are able to see fifteen or twenty cases making progress every time they come with child for treatment. Acknowledgment to Drs. Van Fleet and Lewis for opportunity to treat upward of 300 cases during the past three and one-half years.

Presentation of twenty-six cases before Section, most of whom are not cured cases, but cases still under treatment.

In the discussion which followed, Dr. FRANCIS VALK stated that there were two points in this connection to which he would like to call attention: The first, the etiology of squint, and the second, the future of these children. In regard to the etiology, he gave as an illustration a case of monocular squint. The patient fixed with the right eye. She had a hyperopia of about 5 dioptries. By placing a +4D before the eyes, the squint at once disappeared and she seemed to have binocular fixation, perhaps binocular vision. In the light of these cases, what became of Worth's theory of fusion as the sole cause of squint? Did the glasses restore the function which is said to be absent from birth? There was evidently no restoration of fusion in this case, yet the visual lines appeared straight. An anatomical theory could better explain it. On this theory we must have an essential weakness of some muscles and, when this patient was examined as to the field of vision, the right eye rotated 60° inwards, 40° outwards, and the left eye, 45° inwards and 40° outwards. This showed a weakness of the right externus, and why did the glasses correct the squint? Because they so corrected the refractive error that the retina must receive much sharper and clearer images, and so stimulate the dormant fusion, causing

increased stimulus to the weak externus so as to bring the image of the right eye on the macular region.

This weak external rotation was always found in all varieties of squint. As to the future of Dr. Emerson's cases, they had little obvious squint, but if they recovered binocular vision as they grew older, would they not, when they began to take up the serious work of life and use the eyes for steady work, suffer from esophoria? It would take many years to tell whether this would happen or not. A case he had recently seen had brought this forcibly to his mind. The case had been cured by correcting the refractive error some twelve years previously, and the vision had improved to $\frac{2}{80}$ in each eye with full correction, but now the patient is sixteen years of age and has more or less muscular asthenopia when she studies, and the necessity of operation has presented itself. Time alone would tell what was the future of cases of convergent squint corrected by glasses. His own view at present, in the treatment of this condition, as it is due to an essential weakness, is to shorten one or both externi, and then to try to develop binocular vision and fixation with such aid as Dr. L. Emerson had so ably placed before the Section.

Dr. H. H. SEABROOK doubted whether the fusion faculty could be restored by Worth's method. He also doubted whether the amblyopia of the squinting eye could really be improved to any great extent, but called attention to the fact that quite a number of cases recovered binocular single vision after binocular fixation had been secured by means of glasses or by glasses and operation without any form of subsequent stereoscopic exercises. In other words, as the Worth treatment failed in a certain number of cases, he doubted very much whether any greater success was obtained by it than by the methods thus mentioned.

MONDAY, FEBRUARY 19, 1906. DR. WILBUR B. MARPLE IN THE CHAIR.

Dr. EMIL GRUENING presented a case **showing result of Kilian's operation for frontal sinus disease.** The patient, seventeen years of age, presented himself at Mount Sinai Hospital on Feb. 2, 1906, suffering from empyema of the left frontal sinus. The corresponding eye was dislocated downward and forward, immovable; the swollen lid could not be raised. Sight normal; ophthalmoscopic examination negative. From the nose, copious

discharge of pus, oozing from a point situated between the middle turbinate and outer wall of the nose.

Operation according to Kilian. The anterior wall of the frontal sinus and its floor were removed, also the nasal process of the superior maxillary bone, establishing drainage from the floor of the frontal sinus directly into the nose. The whole wound was closed by interrupted sutures. Next day patient had temperature of 103° ; right side of nose showed circumscribed swelling. Erysipelas. Redness and swelling extended over right side of face, without encroaching upon the sutured wound. The erysipelas ran its course in five days. The sutures were removed on the sixth day. The wound had united by first intention.

Dr. Gruening presented this case because it demonstrated : 1st. That the removal of the whole anterior wall of the frontal sinus does not result in disfigurement of the face. 2d. That the detachment of the periosteum of the roof of the orbit does not cause a muscular disturbance and diplopia. The operation of Kilian is an extension of the operation practised by Jansen. Jansen removes the anterior wall and floor of the sinus; Kilian does the same, but adds the removal of the nasal process of the superior maxillary bone, removes the middle turbinate, and establishes free drainage between the frontal sinus and the nose. Everything that has been claimed for this operation has been obtained in this case.

Dr. J. E. WEEKS inquired as to the necessity of removing the roof of the orbit and also the necessity of removing so much of the nasal process. He had seen cases in which less had been removed do very well.

Dr. GRUENING, in replying, did not think that the complete Kilian operation was necessary in all cases. The roof of the orbit, however, should always be removed, for it is always found softened and necrotic. The removal of the nasal process established a communication with the nose, allowing the external wound to be closed.

Dr. T. R. POOLEY thought the roof of the orbit should pretty generally be removed, depending, of course, upon the extent of the disease. The operation should always remove the entire diseased tissues.

Dr. C. W. CUTLER presented a case of **acute glaucoma operated by Heine's method of cyclodialysis.**

He called attention to two methods which, in the light of

further observation may or may not prove to be of permanent value.

There was as yet no evidence as to their efficacy, but he stated that they seemed harmless, and as they are both supported by certain theoretical considerations, it seemed wise to call attention to them so that, by wider use, conclusions as to their value might be sooner reached.

Cyclodialysis was described by Heine at the last meeting of the Ophthalmological Gesellschaft at Heidelberg; a brief abstract of his paper and the discussion may be found in the *Zeitschrift für Augenheilkunde* of October.

The operation consists in making a small incision through the sclera, 5 or 6mm back of the limbus and without incising the deeper tissues, passing a small blunt instrument, such as a spatula or a probe, forward through the suprachoroidal space into the anterior chamber. The aqueous escapes through the wound, and the probe may be gently moved from side to side, in order to open the angle.

In a recent case of acute glaucoma, T+2, wide pupil, shallow anterior chamber, in which iridectomy would have been difficult, a conjunctival flap was raised and an incision about 2mm long made in the sclera, 5mm back of the limbus; a small blunt probe passed easily forward and appeared in front of the iris in the anterior chamber, aqueous escaped, and the tension fell. A single stitch drew the conjunctival flap over the wound, and the eye was bandaged. There was very little pain at the time of the operation, no hemorrhage into the anterior chamber, and no reaction followed. *Tension remained normal for a week, then rose suddenly.* The operation was repeated through the same passage, but, as it seemed to promise no permanent relief in this acute case, an iridectomy was performed and tension has since remained normal.

In less acute cases, where the lens and congested ciliary processes were not pressed forward, it might have a more lasting effect, but it seemed to him that its chief value was as a preliminary operation to iridectomy where the anterior chamber is shallow, and if the coloboma can be placed at the point where the angle has been opened, the chances of maintaining a patent filtration angle will be greatly increased. It is probable that few of the attempts made from the anterior chamber, such as ant. sclerotomy or Vincentiis operation, reach the ligamentum pectinatum,

and even in iridectomy the root of the iris is seldom reached, so that it is still a problem how it acts, and why it is so often successful.

Dr. C. W. CUTLER also presented a case showing **treatment of gonorrhœal ophthalmia by Torrey's serum.**

He had begun the use of anti-gonococcus serum made by Dr. John C. Torrey at the suggestion of Dr. John Rogers, at the Foundling Hospital, but there were not yet enough cases to make a report worth while.

It is obvious that a large number of cases of all types must be treated by any remedy before conclusions can be reached, and the more varied the point of view, *i. e.*, the larger the number of observers, the better. Nitrate of silver retains its precedence; argyrol has not, in his experience justified the rather extravagant claims made by its advocates and he no longer relied on it exclusively, even in apparently mild cases.

Dr. CUTLER was glad to read Dr. Verhoeff's statement to the same effect in his article on sodium aurate in the same number of the *Journal of American Medical Association*. No one will assert that the present treatment of gonorrhœal ophthalmia is satisfactory, and the experimental use of this serum is desirable. The prospects are perhaps not very promising, for although it has been of great service in gonorrhœal rheumatism, it has been used practically without effect in acute urethritis. Dr. Torrey thinks that this is due to the large number of cocci in the latter condition, and to the fact that they are practically outside of the body and inaccessible to a serum given subcutaneously. Dr. Cutler has given it to two infants hypodermically, and has dropped it into the eyes without any reaction or pain. Both recovered. One was a moderately severe case, and seemed to improve after each injection. The routine treatment was continued, however. The nature of the serum and its mode of production are described by Dr. Torrey and Dr. Rogers in the *Journal of the American Medical Association*, of January 27, 1906, and Dr. Torrey will be glad to provide the serum for those wishing to use it, and will appreciate any reports that may be made to him.

Dr. GRUENING asked what had been the vision in Dr. Cutler's case of glaucoma before and after the operation.

Dr. CUTLER replied that the patient had a cataract and the vision was nearly abolished before the operation. It improved after operation but fell again after the second attack, to improve

again after a subsequent iridectomy. He thought the operation more advisable as a forerunner of an iridectomy to free adhesions. The cases were observed for several months after the operation and it apparently did no harm.

Dr. J. E. WEEKS presented a case in which he had **restored the lower cul-de-sac by means of Wolfe's grafts.**

The patient, a man forty-three years of age, had his right eye enucleated some years ago and an artificial eye was worn until some six months ago when the lower cul-de-sac became obliterated and the artificial eye could not be retained. A plastic operation for restoration of the sac was performed, a Wolfe graft being employed, and the lower border of the flap being anchored to the periosteum. The operation was performed two weeks ago and the result is re-establishment of a cul-de-sac nine millimetres in depth. The flap healed perfectly.

Dr. WEEKS presented this case as the fourteenth successive operation of this character with complete success.

Dr. A. SCHAPRINGER read a paper entitled **congenital word-blindness in pupils of the public schools.**

Among the pupils of public schools who applied at Dr. Schapringer's class at the German Dispensary "to be fitted with glasses," several were found who were backward in learning to read because they were "congenitally word-blind." They were usually emmetropic, sometimes hypermetropic. These children usually succeed in learning to pronounce the single letters of the alphabet at sight, but have difficulty with syllables and whole words. Dr. Schapringer pointed out a quick way of establishing the diagnosis of "congenital word-blindness." After making the child read the letters on an ordinary Snellen chart and noting the promptness with which this is accomplished, he makes the child call out the figures (numerals) on another Snellen chart. If the child calls out the figures more promptly than it did the letters, the case is diagnosed as one of "congenital word-blindness." Our knowledge of this defect is the result of the labors of W. Pringle Morgan, James Hinshelwood, Edward Nettleship, and Otto Wernicke, a brief résumé of whose publications was given by Dr. Schapringer.

Pure uncomplicated "word-blindness" cannot occur in China or in any of those countries which have adopted the Chinese method of writing, which is not alphabetic, but "ideographic."

Dr. J. H. CLAIBORNE read a paper entitled **concerning types of congenital symbol amblyopia.**

The following is an abstract by the Secretary:

Dr. Claiborne referred particularly to two cases in which he considered that there was congenital deficiency, or at least a tardy development of the word memory-cells. He thought that congenital word-blindness was a department in pediatrics and neurology which had not received the attention which it deserved.

The first case, a boy of ten years of age, was seen on account of an injury to his left eye, but the injury had no bearing upon his other symptoms. While examining him, Dr. Claiborne was struck by his slowness and peculiarity, and the mother stated that he had never been able to learn how to read; he could write a few simple words. At times he named some of the letters of the alphabet correctly; later on he failed to rename the same letters. When asked to write certain letters of the alphabet he made repeated errors. For a capital K he made a capital T; for a capital T he wrote little t, and he could not write u at all. Although he wrote a K for a T, when asked to write K he could not make it, but when asked to write his name he did so with readiness. Dr. Claiborne believed the name was written automatically. The letter E seemed to have great difficulty for him. At times he called it S, at other times correctly. Although he wrote his name correctly, he could not recall the letter E in it, although he had written it. His refraction was about emmetropic, but no accurate test of vision could be made, as he was never certain about the letters. His field of vision was normal and he was right-handed. In other respects he was rather bright, understood words and commands, knew the meaning of ordinary words, recognized objects and their uses, and, according to his mother, was talkative, communicative, and even garrulous at times; played with other boys in the street in a normal manner. His inability to learn his letters accurately, his consequent inability to remember and recognize words, smacked of just ordinary ignorance, and there was a strong temptation to dismiss the case by calling the boy a fool, but his obvious general intelligence about objects, his normal power of recognizing the meaning of spoken words, and obedience to commands that involve other things than writing, saved him from this criticism. He is abnormally simple in respect to reading written words or letters. His word-blindness was not for

other written symbols, for he easily recognized and correctly called figures. The case was then distinctly anomalous, and was distinctly not one of word-blindness, for he bore some marks of motor aphasia.

His condition was really one of word-amblyopia for written and printed alphabetical signs or symbols. The lesion was doubtless a congenital one and probably consisted in imperfect development and tardy reaction of the word and letter memory cells. The lesion was probably in the cerebral cortex, in the region of the angular gyrus on the left side, seeing that the boy was right-handed.

Dr. Claiborne's second case, aged nine years, had never been able to read. He was bright, smart, and alert. He comprehended words and sentences perfectly when spoken, knew common objects and their uses, but the moment he was set to looking at printed words or written dictation he became confused and showed all signs of shyness and lack of self-confidence. He recognized letters without error, but when put together to form words the difficulty began. The word "how" he read "you." The word "are" he called "ray"; "made" he called "ham," or again "man."

The word "Herbert" he wrote from dictation, letter by letter, "Herbdred," and called it "Purram." "Anna" he called "Ed." He made figures accurately, knew them all, and did some small sums in addition and subtraction as quickly as any child of his age could.

Dr. Claiborne did not believe there was any sign of motor aphasia in this case, because, although he wrote at dictation imperfectly, the letters of his writing were all correctly made, but improperly put together. They never degenerated into a scrawl, either meaningless or irre recognizable, as is common with motor aphasics when they write spontaneously or at dictation. His vision was normal, his fields also, and he was right-handed. The significant and peculiar fact in the case was that although the boy could recognize letters, the component parts of a word, and could pronounce each letter in each word, when he had finished he could not, except with several well-known words, such as "cat," "rat," and "dog," make the sound which the combination of letters really warranted.

Dr. Claiborne thought that in the second case the prognosis was good, for it seemed probable, if individual letters could be

remembered, words which were composed of letters should be remembered, under repetition, and this prognosis was all the more supported by the present method of instruction in vogue in public schools at least, the method of teaching children to read by looking at words and recognizing them as a whole. In short, the matter seemed to reduce itself to a repetition of impressions upon the cerebral cells. Since the boy was right-handed, the lesion probably was on the left side and in the angular gyrus.

Dr. CLAIBORNE believed that figure amblyopia was the explanation of the inability of some people, intelligent and logical in other respects, to understand symbolic mathematics. The memory, of course, was the basis of it all, as it is the basis and commencement of every intellectual act.

In regard to the training of these children, when cases of this description are observed, Dr. Claiborne believed that they should be carefully differentiated, and similar cases should be grouped together. Methods of teaching should then be instituted to awaken the torpid cells into normal activity, if possible, and if this was found to be impossible to get the best attainable results, and he believed that the basis of the instruction should be repetition. So long, however, as these cases were not intelligently recognized, classed together, and properly instructed, so long should we fail to get the best results in these abnormal children.

In the discussion of these two papers which followed, Dr. CLAIBORNE thought that the average boy had figure amblyopia. Many boys complained of their arithmetics. Repetition and patience were required.

Dr. LINN EMERSON thought that the cases of inveterately bad spellers were cases of word amblyopia. He had known a well-marked case in a well-educated man of marked business ability.

Dr. A. SCHAPRINGER thought that English spelling was more responsible for these cases than that of any other language. Almost all the cases reported had been reported by English surgeons. Wernicke's cases, however, spoke Spanish, an easy language in regard to spelling.

But Dr. Schapringer had no doubt but that there were more cases in English- than in German-speaking people.

Dr. CLAIBORNE thought that the cases were more common than was generally supposed. In instruction, the cultivation of left-handedness in these cases might be of service.

Dr. GEO. S. DIXON read a paper entitled **on the localization of foreign bodies in the eye and orbit, with lantern-slide illustrations.**

Dr. Dixon employed for this purpose his own modification of the MacKenzie-Davidson apparatus, which has already been described in the ARCHIVES OF OPHTHALMOLOGY, vol. xxxiv., No. 3, 1905.

This modification he had subsequently improved upon. The full description of his most recent apparatus will be found in the *New York Eye and Ear Infirmary Reports* for the year 1906. The most important points are the following: Instead of a ball with a set screw, he now employs a split sleeve to which the indicator is attached. The sleeve has a sufficient amount of friction to hold it in position, and is not disarranged as the old form was likely to be during attempt to set the screw. A second instrument has been devised for the purpose of squaring the head. Dr. Dixon states that unless the head is correctly placed so that it will be in the same position in reference to the plate as the plate should be in reference to the chart on which the location of the foreign body is to be plotted, errors are likely to occur.

Dr. WILLIAM M. SWEET of Philadelphia agreed with Dr. Dixon upon the importance of an early examination by the X-rays in all cases of ocular injury by foreign bodies before the magnet is employed. Since the different methods of localization were all based upon the same principle of triangulation of the foreign body at two exposures, he thought the accuracy in the results depended largely upon the skill of the operator. In the localizing apparatus which he has employed for the past ten years, two indicating rods were used, the displacement of the shadow of the second indicator on the plate in reference to the first indicator permitting the operator to determine the source of the X-rays at each exposure with great accuracy. He thought that with two indicators there was less liability to error than when only one indicator was used. Dr. Sweet referred to the variations in the size of the adult eyeball from errors of refraction or normal causes, and the importance of this difference in the situation of bodies localized at the posterior part of the full-sized globe.

Dr. E. GRUENING thought that the more of this work one did the more accurate would he become.

Dr. J. E. WEEKS thought the indicator of Dr. Dixon rather better generally than that of Dr. Sweet.

ARCHIVES OF OPHTHALMOLOGY.

ON REFRACTION AT A TORIC SURFACE.

By H. C. LOMB, ROCHESTER, N. Y.

(With five figures in the text.)

WITH the increasing use of toric lenses in ophthalmological practice, it becomes of importance to inquire closely into the refraction at toric surfaces if the maximum efficiency is to be obtained, particularly as the general problem—namely, that of tracing analytically the course of *any* ray or pencil when refracted at such a surface—



FIG. 1.

does not as yet appear to have been solved. The case usually alone considered is that of rays, or pencils, traversing the region immediately adjacent to the optical axis of the

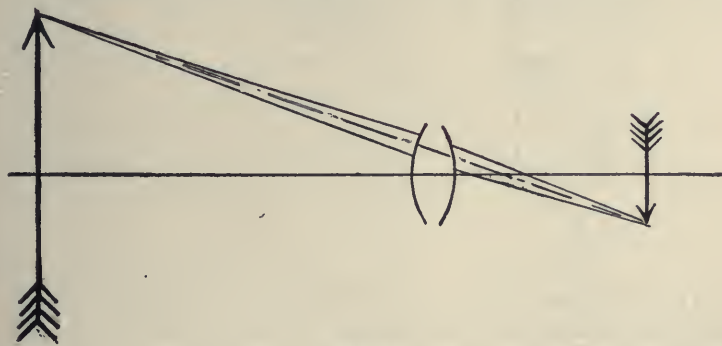


FIG. 2.

lens (Fig. 1), thus leaving out of account the light incident

on the peripheral portions of the lens and such coming from parts of the field of view other than the centre (Fig. 2). But it is exactly on account of their action on the last-mentioned rays and pencils that toric lenses have their peculiar significance; the presence of these extra-axial rays cannot, therefore, be disregarded with impunity.

Before studying the refraction at toric surfaces, we must seek to obtain an accurate notion of the nature of the surface itself.

The toric surface may be considered to be generated by a circle rotating about an axis in its own plane; in the pneumatic tire of automobiles we have a familiar example. In Fig. 3 the generating circle is shown in two positions, the axis of rotation being assumed vertical.

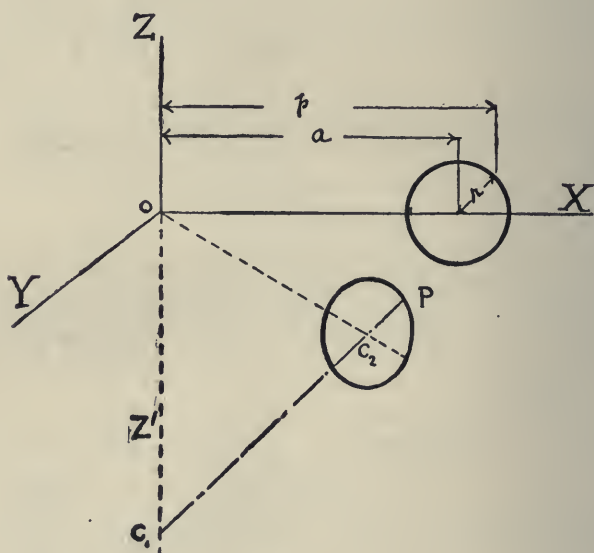


FIG. 3.

We introduce a system of rectangular co-ordinates, X, Y, Z , and take as axis of Z the axis of rotation just mentioned. Let r be the radius of the generating circle and a the distance of its centre from the origin of co-ordinates O . Then

evidently the co-ordinates x, y, z of any point P on the surface will be joined by the relation

$$z^2 = r^2 - (\sqrt{x^2 + y^2} - a)^2 \quad (1)$$

This is the equation of the toric surface.

We may note in passing that for $a = 0$, equation (1) reduces to the equation of a sphere :

$$x^2 + y^2 + z^2 = r^2$$

The sphere is thus a special case of the torus.

From the mode in which the toric surface is generated, it is plain that its curvature varies in different planes or "meridians." A convenient and exact method of treating such surfaces is to imagine it divided into small elements and to consider their normal sections—that is to say, to erect the normal to the surface at any point to be considered and, by passing planes through the normal in different directions, to examine the sections of the surface-element made by these planes. The aggregate of all these sections at any point gives a true picture of the surface in the neighborhood of that point, and the study of the surface is reduced, as it were, to that of plane curves.

Each of these normal sections will, in general, exhibit a different curvature, but among all the values so found, there will be one whose curvature is less and one whose curvature is greater than any other, and, according to a well-known theorem, these two sections or planes of maximum and minimum curvature are perpendicular to each other. They are called principal sections, and the radii of curvature of the curves cut out of the surface by them, are called the principal radii of curvature of the surface at the point in question.

In Fig. 4, HKLM represents a small element of the

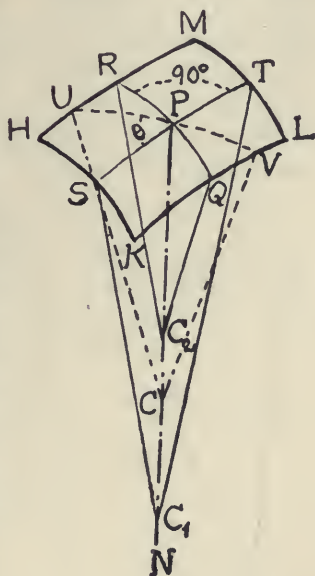


FIG. 4.

We therefore find for the *principal radii of curvature of the toric surface* in any point (x, y, z) :

$$s_1 = \frac{pr}{p-a} \quad s_2 = r \quad (3)$$

where $p = \sqrt{x^2 + y^2}$;

and for the radius of curvature of any other normal section at this point making an angle θ with the plane of s_1 :

$$\begin{aligned} \frac{1}{s} &= \frac{(p-a) \cos^2 \theta}{pr} + \frac{\sin^2 \theta}{r} \\ &= \frac{1}{r} \left\{ 1 - \frac{a \cos^2 \theta}{p} \right\} \end{aligned} \quad (4)$$

Having examined the nature of the toric surface itself, we are now prepared to inquire into its refractive action. From the law of refraction we know that when a ray impinges upon any surface, this incident ray and the corresponding refracted ray lie in the same plane, namely, in the plane determined by the incident ray itself, and the normal to the refracting surface at the point of incidence. This plane, called the plane of incidence, is evidently one of the "normal sections" referred to above. In this plane, in the immediate vicinity of the point of incidence, the surface acts like a spherical surface having a radius equal to the radius of curvature of the toric surface in this plane, which curvature may be found from equation (4).

We have thus reduced the refraction at a toric surface to the refraction at a spherical surface.

A further discussion of the above, together with some interesting applications, must be reserved for a future occasion.

QUININE AMAUROSIS WITH REPORT OF A CASE.¹

By FRANK JUDSON PARKER, M.D.,

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(With two colored plates.²)

SOON after the isolation of the alkaloid quinine from the Peruvian bark by Pelletier and Caveuton in 1820, visual and aural disturbances were noted after large doses of the alkaloid and its salts. The first record we have was by Berandi, published in Milan in 1829; he experimented on men with the sulphate of quinine and noted headache and the effect on the eyes and ears. Beydler noted temporary amaurosis after a dose of forty grains of the sulphate. Giaconimi published the first complete report. The patient, having taken one hundred and eighty grains of the sulphate, became unconscious, deaf, and blind, remaining so for a prolonged period. Von Graefe recorded the first ophthalmoscopic examination in two cases of partial amblyopia, the fields and fundus being normal.

The first case of quinine amaurosis, as we understand it at present, was described by Roosa in 1879; his case took the tincture of the bark. It has been proved by experiments that any of the alkaloids of quinine will produce amaurosis, but the sulphate is the most active. That the drug has a selective effect upon the optic nerve and retinal circulation has been proven by the experiments of de Schweinitz on animals and of Barabaschew upon healthy men.

¹ Read at the meeting of the Ophthalmological Section of the New York Academy of Medicine, March 19, 1906.

² These plates were not received from Germany in time for publication with the paper in this number of the ARCHIVES. They will appear in the next (November) issue.—ED.

In many of the cases reported the dose is indefinite, varying from twelve grains to an ounce in twenty-four hours, resulting in pallor of the disk, vasculitis, contraction of the retinal arteries, and contracted fields which remained so with central vision normal.

The case to which I ask your attention seems of especial interest because the patient had no idiosyncrasy for the drug, the exact dose was known, and an exceptional opportunity was afforded for following the case and studying the ocular changes from perception of light to normal telescopic vision.

Mr. J. H., age forty-three, an architect and builder, was admitted to the Presbyterian Hospital on June 4, 1905, in a condition of stupor, irregular and rapid respiration, and occasional periods of collapse, with the following history: had been under a physician's care for bronchial pneumonia, and by a misunderstanding of orders had taken forty-eight five-grain capsules of quinine sulphate in twelve hours, a total of two hundred and forty grains during the night of June 3d. He awoke the next morning with terrific noises in his ears, loss of sight, and delirium alternating with collapse. Examined on June 8th. I found the pupils wide dilated, no reaction to light, cornea slightly hazy and marked hyperæsthesia, tension minus two, and perception of light; as far as I was able to test him in his condition his hearing was normal; he had not complained of noises or deafness since the first twenty-four hours after taking. Fundus examination, right eye, showed the following: extreme pallor, nerve pearly white, thrombus of the inferior branch of the retinal vein, the blood column broken in places, endoarteritis of the large branches and obliteration of the small arteries, veins dilated. The iris was very dull in appearance and showed no reaction to light. The left fundus showed the same condition except the thrombus was of the superior branch of the retinal vein. The patient was put at once on the following: nitroglycerine $\frac{1}{8}$ grain every four hours, amyl nitrite *zm* three times a day, strychnia nitrate $\frac{1}{80}$ gr. Hypodermic once a day, increasing $\frac{1}{8}$ each dose up to $\frac{1}{10}$.

June 11th.—General condition much improved; able to give intelligent answers and seemed interested in surroundings; counts fingers at three feet with each eye.

June 13th.—Pupils widely dilated, no reaction to light or

accommodation, tension minus 2, hyperæsthesia of the cornea, circulation established in small arteries around the disk, nerve a better color, counts fingers and recognizes objects at five feet with each eye.

June 15th.—Pupils smaller, no reaction to light (anastomosis of the small arteries about the disk), tension minus 1, counts fingers at eight feet.

June 17th.—Pupils smaller and react slightly to accommodation, not to light; counts fingers at sixteen feet.

June 19th.—Pupils react to light, tension minus 1, circulation well established in region of disk, veins normal. Vision $\frac{20}{200}$ each eye.

June 20th.—Tension slightly minus, pupils react to light, vision $\frac{20}{40}$ each eye.

June 24th.—Vision $\frac{20}{40}$, reads Jaeger number 4 at 3 feet. Circulation well established by enlargement and anastomosis of the small arteries. Amyl nitrite and nitroglycerine stopped.

June 30th.—Tension normal, vision $\frac{20}{80}$, pupillary reaction good. Reads Jaeger No. 2 at 3 feet. Discharged from the hospital, treatment discontinued except $\frac{1}{80}$ gr. strychnia three times a day. The fields were taken and were as follows:

Right eye.	{	Superior	10	Left eye.	{	Superior	10
		Inferior	30			Inferior	32
		Nasal	18			Nasal	30
		Temporal	20			Temporal	30

The color fields are shown in the charts (see note page 420). The patient was next seen by me on Sept. 22, 1905; he had gained thirty three pounds in weight, general health good, only discomfort with eyes is not seeing well at night and only seeing straight ahead as he expressed it. Vision was telescopic and $\frac{20}{80}$ in each eye. Pupillary reaction and tension normal. The fields slightly larger and more regular than on June 30, 1906.

The experiments of de Schweinitz on dogs were to determine the lesion of quinine amblyopia and the effect of the different salts of the drug; hypodermic injections in varying doses were given the animals; thrombosis of the central vein was seen in one case, optic atrophy, marked contraction of the arteries, and changes similar to those seen in the human subject. The effect was best obtained by using the bimurate of quinine; his experiments proved that large doses of quinine produced atrophy of

the optic nerve, thrombus and endovasculitis of the blood-vessels. The symptoms are very well marked and fairly constant: sudden blindness, pallor of the optic nerve resembling atrophy, very marked contraction of the retinal arteries, contraction of the visual field, dilatation of the pupils, and color blindness. Nystagmus was noted by Roosa, anæsthesia of the cornea by Voorhies, and Tiffany records increased tension. It is to be noted in the case I am reporting that the tension was lowered, with marked hyperæsthesia of the cornea; the ear symptoms were noted during the first twenty-four hours only.

The prognosis in these cases is good, depending on the dose and the idiosyncrasy of the case. Normal telescopic vision has been the final result in the majority of cases reported, with contraction of the fields, which is permanent.

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A CASE OF MICROPTHALMUS WITH UPPER-LID CYST.

CLINICAL REPORT BY DR. CHARLES H. MAY ; PATHOLOGICAL REPORT BY DR. WARD A. HOLDEN.

(With six figures on Text-Plates XII. and XIII.)

Clinical Report.

The patient, William Gordon, was born December 21, 1904 ; precipitate labor, full term ; mother has tuberculosis ; mother's eyes normal.

Present Condition (December 28, one week after birth) : The right eye appears normal. The left eye presents a large cystic protrusion, pink in color, occupying the entire palpebral aperture and appearing to consist of the everted conjunctival surface of the upper lid. (Fig. 1, Text-Plate XII.) The cystic mass measures 18mm in width, 12mm in height, and projects 10mm. Upon puncture with a hypodermic needle there is an escape of a single drop of clear, yellow fluid, without any apparent reduction in the size of the cyst. The lids can be separated with difficulty by the aid of retractors, and when this is done it is seen that the protrusion is attached to the upper lid. When the cystic mass is raised with a lid retractor and the lower lid drawn down, a microphthalmic globe can be seen. The cornea measures 7mm in width and 6mm in height, is flattened, but perfectly transparent ; the iris presents an eccentric, pear-shaped pupil, with the narrow extremity pointing upward and inward ; there is a complete posterior synechia ; the area of the pupil is grayish and opaque (cataract), so that no view of the interior of the eye can be obtained.

Five months later (May 3, 1905) the conditions were the same,



FIG. 1. Head of the child, with the cyst in the left upper lid.



FIG. 2. Upper-lid cyst. Natural size.

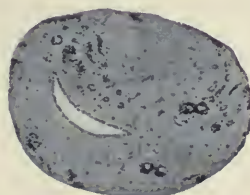


FIG. 3. The pedicle of the tumor, showing proliferating large cells at various points on its outer surface and numerous rosettes near these points ; Nissl stain.

excepting that the mass had grown slightly, and now measured 20mm in breadth, 14mm in height, and projected 12mm.

Operation, June 8, 1905.—Under chloroform anæsthesia, the conjunctiva covering the cyst was divided transversely and separated from the mass by blunt dissection. The separation was effected quite readily everywhere, excepting over an area about 4mm in diameter, where there was a direct connection between the mass and the eyeball. The situation of this attachment was practically at the equator of the eyeball and about 3mm above its horizontal meridian. This connecting portion was of dark color, and was found upon division to be formed partly of pigmented and partly of non-pigmented tissue. At the seat of the attachment a probe could be passed into the eyeball for a distance of 15mm, but it was impossible to determine whether between the tunics of the eyeball or into the vitreous.

July 19, 1906.—The microphthalmic eyeball has enlarged since the last note, and there is not a great deal of difference in the size of the globe on the two sides. The left cornea measures 8mm in the horizontal and 7mm in the vertical diameter; the right cornea measures 12mm in the horizontal diameter. The width of the palpebral aperture is 20mm on the left side and 24mm on the right.

*Pathological Report.*¹

There was a small eyeball without coloboma of the iris and with a cataractous lens. From a point on its upper-inner surface, near the equator, issued a narrow stalk which expanded into a large tumor lying behind the upper lid (Fig. 2, Text-Plate XII.). This tumor was removed by Dr. May from the patient, a boy of six months, and since then the eyeball has grown until a year after the operation it is nearly normal in size. Lower-lid tumors are common enough, but the upper-lid tumors have been seen only a few times (Purtscher, Snell, Parsons, Collins).

Development.—Evidently a knuckle of the secondary optic vesicle forced its way upward into the overlying mesoblast and, continuing to develop in extent, formed a mass of folded rudimentary retina which is surrounded by a fibrous sheath continuous with the sclera. The stalk is a tube of retina with a narrow lumen connecting the cleft-like cavities of the tumor with the vitreous

¹ Presented at the meeting of the American Ophthalmological Society, June, 1906.

chamber of the eyeball (Fig. 3). The lumen surface corresponds to the inner surface of the retina within the eye. The stalk is surrounded by a layer of pigment continuous with the pigment epithelium, and is enclosed in a fibrous sheath continuous with the sclera.

On passing from the stalk into the tumor proper the relations of retina, pigment epithelium, and outer fibrous coat are modified. There has been an invagination and a folding of the retina, so that what corresponds to the outer surface of the retina lines many of the clefts in the tumor as if it were the inner surface of the retina (Fig. 4, Text-Plate XIII.). The pigment epithelium surrounding the outer surface of the retina has mostly disappeared, and the fibrous coat and the retina pass one into the other without any line of demarcation.

But where a fold in the retina has allowed the fibrous sheath to pass into the central portion of the tumor, pigment epithelium has in several places been carried in also, and now lies in an anomalous position as regards the retina.

The rudimentary retina in this case is composed simply of a network of glia fibres and scattered nuclei, enclosing numbers of ganglion cells, large and small. There is no division into layers and there are no distinct outer and inner limiting membranes.

The feature of this case to which I wish to call attention is the presence of numbers of the rosette formations which are found in some gliomas and in some retinas of arrested development, which were considered neuro-epithelial formations analogous to the rods and cones by Flexner and by Wintersteiner, who first independently described them. Since then Ginsberg, Brown Pusey, and Verhoeff, among others, have studied these rosette formations. There has been considerable discussion as to the nature of their component cells. Their genesis and development are well shown in this case. Here the primitive neuro-epithelial cells, which compose the inner layer of the secondary optic vesicle, have become differentiated into spongioblasts and neuroblasts, which, attaining their full development, have formed, on the one hand, glia cells and fibres, and, on the other, ganglion cells. Of these elements, jumbled together without definite arrangement, this rudimentary retina is chiefly made up.



FIG. 4. A section through the middle of the tumor. The outer portion connective tissue, the inner rudimentary retina.

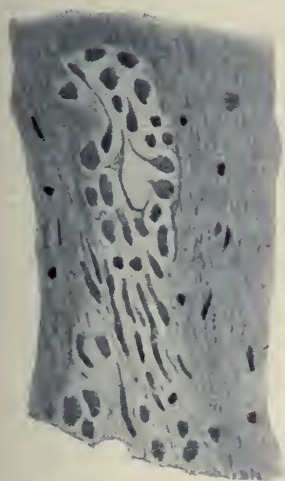
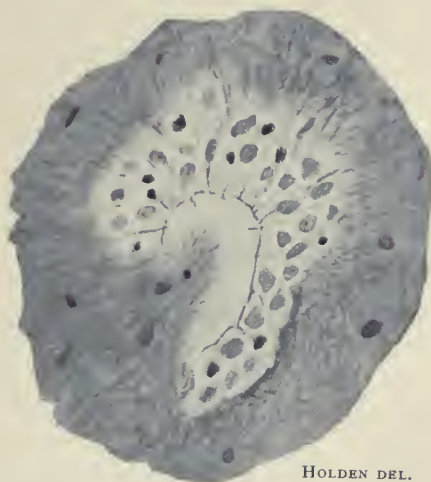


FIG. 5. Large cells growing inward from the outer surface of the retina to form a rosette.



HOLDEN DEL.

FIG. 6. An almost complete rosette surrounded by ordinary glia tissue.

But here and there along the margins of the retina are single cells, or groups of cells, with large nuclei and large bodies which are to be considered embryonic retinal cells which have not yet developed. Now at various points on the outer surface of the retina these cells have proliferated, and, assuming a spindle form, have pushed perpendicularly into the retina like ependyma cells, and then have formed what in sections appear as spirals or as circles with a fine basal membrane, through which the large basal cells send filaments into the cavity (Figs. 5 and 6 Text-Plate XIII.). Rows of smaller cells, gradually assuming the characteristics of ordinary glia cells, surround the large basal cells, and the rosette is formed. The larger cells push into the neuroglia tissue without being directly connected with it, but the smaller peripheral cells in the rosettes send their processes out into the neuroglia with which they are in intimate connection.

The principal cells in these rosettes are seen to develop atypically from embryonic cells which in their natural course would have become rods and cones.

A TIME-SAVING ADDITION TO TEST-TYPE CARDS.

By HOLBROOK LOWELL, M.D., BOSTON, MASS.,

CLINICAL ASSISTANT, MASSACHUSETTS CHARITABLE EYE AND EAR INFIRMARY.

(With one figure on Text-Plate XIV.).

THOSE who have had much experience in the refraction rooms of large ophthalmic hospitals will recall the difficulty encountered and the time lost in trying to get patients to read the test-card letters in order, or even at all. When a patient is asked to read the *lowest line he can*, he invariably says: "I can't read the lowest line, doctor!" You ask him to read the letters from the top down, and he reads to the third or fourth line, then begins to call off the *numbers* of the lines. Again, when asked to read the third line from the bottom, he says that he can't read it, but later, with a little coaxing, he reads it perfectly well. He was too nervous to count up three lines from the bottom. Many mechanical test-type cards have been devised to meet these difficulties, and they serve very well in the office, but are not so practical for hospital use, because of their complication or expense. Some two months ago the writer thought of a very simple device, which has proved to work equally as well in the hospital as in the office. A strip of gummed green paper, 1cm wide, is pasted just below the $\frac{2}{3}$ line on the test-type (Snellen) card, and a strip of gummed red paper, 1cm wide just below the $\frac{3}{8}$ line. (See illustration.) Now you will see that we have green and red lines on the test-type card, each line being between two important test-type lines. In the office, patients usually will voluntarily say that they can

ILLUSTRATING DR. HOLBROOK LOWELL'S ARTICLE
ON TEST-TYPE CARDS



read the letters either above or below the red or green line. In the hospital it was seldom necessary to point out the letters, as was often the case before the colored lines were used. There is no confusion when you ask a patient to read either just above or just below one of the colored lines. Experience shows that these colored lines, besides fixing the patient's attention on the letters you wish him to read, give a useful hint as to the patient's color perception. By actual comparison with the newer test-type cards, having lines indicated by the large numbers, the writer has found that his device of the colored lines is very much less confusing to the average patient. He has therefore been led to report this little device because of his confrères' kindly approbation and enthusiastic use of it, and he hopes that it may serve to eliminate one of the tiring features of clinic and office vision-testing.

ABSTRACT REPORT OF THE SECTION ON OPHTHALMOLOGY OF THE AMERICAN MEDICAL ASSOCIATION.

BOSTON, MASS., JUNE 5-8, 1906. THE CHAIRMAN, DR. LEWIS H.
TAYLOR, WILKESBARRE, PA., PRESIDED.

Chairman's Address: Dr. Taylor said that to present a resumé of the programme of Ophthalmology during the past year would take up more time than should be allotted to an introductory address, and that an excellent review of this work could be found in the *Inter-State Medical Journal* for January, 1906, by Dr. John Green, Jr., and in the *Ophthalmic Yearbook*, edited by two of the most active workers, Drs. Jackson and de Schweinitz. He referred to the presence in the Section last year of Prof. Hirschberg and advocated the precedent set of securing some distinguished man in ophthalmology to address the Section. Prof. Carl Wurtzburg Hess had been expected at this meeting, but had found it necessary to cancel his engagement. The chairman referred to the death during the past year of Dr. Swan Burnett, of Washington, in which ophthalmology had suffered a great loss. He announced the adoption of the new plan of having the papers to be read before the Section published in advance, which would be submitted to the Society for its approval. Dr. Taylor said he thought this Section should be the representative Ophthalmological Association of the country; it was the only society from which a reputable oculist could not be debarred by personal prejudice or the delays of membership committees. The utterances of this Society, when unanimous or nearly so, should have greater weight than those of any other ophthalmological society in this country. The last word had not been said on a great many subjects in ophthalmology, as, for instance, on ocular muscles, on cataract operations, on ocular tumors, etc., and there still remained large fields for investigation. The subject of refraction, too, he thought required a great deal of con-

sideration. More careful instruction in ophthalmology in the medical schools was advocated, and the scientific ventilation of school buildings and their proper lighting with reference to eyesight were also matters that deserved the consideration of the Section. In conclusion, the Chairman said that he hoped at an early date for an expression from the Section as to the prevention of blindness and some definite and uniform instruction and legislation along that line.

A more uniform standard for the illumination of visual test types. Dr. CHARLES H. WILLIAMS, Boston, described a method of obtaining a uniform illumination of the test types by means of two vertical columns of eight five-candle power incandescent lamps placed on each side of the test-type card, one foot in front of the plane of the card and one foot from the nearest edge of the card. The observer was protected from the lights by a screen. The amount of light reflected from the card was measured by a special form of photometer, the effect of varying the illumination in reducing the apparent acuteness of vision being also measured, as well as the amount of reduction of the illumination caused by introducing a fixed amount of resistance into the circuit.

Dr. O. F. Wadsworth, Boston, thought the idea a practical one as there was no question that on very dark days you could not use daylight satisfactorily and artificial light must be employed, but he thought the reflection from the white background somewhat too brilliant.

Dr. Nelson M. Black, Milwaukee, advocated more uniformity in reporting visual acuity as measured by test types, and thought there should be some standard of illumination expressed in candle-power units. He had devised and used a luminous test-type cabinet (*Ophth. Record*, April, 1904), in which the letters are engraved on porcelain and transilluminated with three incandescent lamps of eight-candle powers each. Dr. George F. Keiper, Lafayette, Ind., passed around photographs of a test-type cabinet which he had devised. Dr. Miles Standish, Boston, thought Dr. Williams's method radically wrong, in putting a light card in a black box, as it would produce fatigue of the retina. The photometer he considered a very excellent instrument. Dr. H. V. Wuerdemann, Milwaukee, thought there was great necessity for some uniform standard for illumination of test-types,

but thought the method of Dr. Williams would produce retinal fatigue; the background instead of being black should be a dark gray. Dr. Lucien Howe, Buffalo, referred to the Crook radiometer used twenty years ago as a very excellent little photometer, though it was not to be compared with the excellent method of Dr. Williams. He thought the test-types of Dr. Williams very excellent.

A new supplementary test for color vision ; the semaphore lamps used in railway service being the source of illumination. Dr. NELSON N. BLACK, Milwaukee, Wisconsin. The writer referred to the dissatisfaction expressed at methods used in testing color vision, which he said had created a demand for a supplementary test which various forms of lanterns had attempted to supply. Such a test, he said, must fit exactly conditions found in practice; persons tested should be required to name the objects; objects for testing should resemble objects in actual use; comparison of colors should be required; test should give impression of signal seen at a distance; it should be such as could be conducted indoors. In the author's supplementary test, the optical laws were brought into operation which reduce the apparent size of an object when looking through the wrong end of an opera- or field-glass. The source of illumination was the standard semaphore lamps actually used in railway block signaling. With the several measurements known, the apparent distance of the object could be deduced from a formula.

Dr. Charles H. Williams, Boston, said a practical difficulty was that the men could give the name to the impressions which they received from the two lights, although they might be extremely defective in color perceptions; there should be a choice between different shades of the same color. Dr. O. P. Frank, Chicago, thought that Dr. Black's formula did not take into account the fact that the light varies as the square of the distance, nor did it take into account the focal length of the lens, the thickness of the glass, and the source and kind of light. The absorption of light, too, he said, varied according to the angle of incidence. Dr. W. R. Parker, Detroit, had had two years' experience with Dr. Williams's lanterns and found them a very valuable aid, having been able to detect color-blindness in those who could pass the worsted test. Dr. Nelson M. Black, in closing the discussion, called attention to the fact, in reply to

Dr. Williams's remarks, that different shades of glass were used in these lanterns. The instruments, he said, were only in the experimental stage, and the working out of the formula might not be at all perfect yet.

A new phenomenon of color conversion. Dr. GEORGE T. STEVENS, New York. This phenomenon which the writer called attention to was as follows: if in the midst of a somewhat extended surface of a given color a narrow strip of complementary color is viewed with a fixed gaze, the narrow strip will be eliminated and its place will be occupied by the predominant color. It was not a color illusion and differed from color phenomena hitherto described. Comparisons were made with simultaneous contrasts, with successive contrasts or after-images, the phenomenon of Purkinje, that of Troxler, and other known principles.

Dr. Charles H. Williams, Boston, considered that the explanation of the phenomenon depended upon two things, chromatic aberration and retinal fatigue. Dr. Nelson M. Black, of Boston, thought that the bleaching effect of various colors of the spectrum upon the visual purple might help to account for the phenomenon. He thought it possible that the long-continued effect of gazing at the green outer color produced so much bleaching of the visual purple at the particular part of the retina the rays fall upon, that the red, after a time, failed to make any impression on that part of the retina. Dr. F. H. Verhoeff, Boston, thought that chromatic aberration did not play any part in the phenomenon, that the diffusion circles would be so small in comparison with the lines of the diagram as not to cause confusion. He did not consider that accommodation played any part either, as could be shown by holding a pencil between the eye and one edge of the red square and looking at it steadily; the phenomenon would take place, and if you removed the pencil, the red would flash out. Dr. Edward Jackson, Denver, suggested that suppression of the image, as when using the ophthalmoscope or microscope with one eye, might have some bearing on the phenomenon. He did not think retinal fatigue played any part in the matter. Dr. Miles Standish, Boston, said that the phenomenon did not always occur with him, and it was evident that it differed with different people. Dr. George T. Stevens, New York, in closing, said he did not

think fatigue of the retina played any part in the phenomenon because many people could make the conversion in a second.

Dendritic keratitis of malarial origin. Dr. E. C. ELLETT, Memphis, Tenn. The writer described an uncommon form of corneal inflammation, appearing almost invariably as a complication of acute malaria. It affects the cornea in a characteristic manner, namely, with an ulcer of peculiar shape (dendritic or branching), which does not tend to suppurate, is never multiple, and rarely, if ever, attacks but one eye, tends to run a protracted course, and, as a rule, without marked uveal irritation. It is probably trophic. In addition to appropriate internal treatment, the local application of tincture of iodine often had a good effect, though frequently a milder means of treatment was best.

Dr. C. J. Kipp, Newark, N. J., said that this form of keratitis he had found almost exclusively among persons suffering from malarial poisoning. In former years, when malarial fevers were very prevalent in his locality, he saw a great many cases of this form of keratitis, but at present, when malarial fevers were less frequent, but few cases came to his notice. Where there was much secretion he had found a solution of silver nitrate, one to two per cent., of benefit. Dionin had also been valuable in the form of an ointment of two to five per cent. He believed that quinine given in large doses had a beneficial effect. He called attention to a class of cases presenting the appearance of choked disks in which the disease was really a circumscribed retino-choroiditis, in which cases the patch of retinal choroiditis is stretched on the border of the papilla, and said the true character of the disease was often not discoverable until the papillitis had subsided, when there was found an atrophic patch fringed with pigment. Dr. H. Molton, Fort Smith, Arkansas, had seen the disease follow chronic malaria. Sometimes there were ulcers in which there were shreds of epithelium about the edges of the dendritic area, and one should not forget that it was possible for these to become infected with pus-forming germs.

Dr. George F. Keiper, Lafayette, Ind., had had a case last year in which there were no symptoms of malaria, and on bacteriological examination a germ had been discovered which could not be differentiated.

Dr. John Green, Jr., St. Louis, called attention to the use of quinine bisulphate in three per cent. solution for local treatment,

used by dipping a cotton-wound probe in the solution and passing it over the surface. Dr. Leartus Connor, Detroit, had not found that local treatment materially hastened recovery, nor that constitutional treatment was very efficacious. In the last two cases he had observed good effects from the use of salicylate of strontium. Dr. Edward Jackson, Denver, took issue with Dr. Ellett's description, that in a sense it could not be said that there was any characteristic change in sensibility of the cornea. The change in sensibility of the cornea, he said, was very easily overlooked, because it might be lost in limited sectors and not over the whole cornea. Dr. S. D. Risley, Philadelphia, had observed that these cases got rapidly better under periodic doses of quinine and arsenic, though he was not prepared to say that they did not act simply as tonics. He referred also to their tendency to recurrence at the recognized periods for recurrence of the fever, and thought there was something specific in this particular form of keratitis.

Unilateral inflammations of the optic nerve and retina.

Dr. A. A. HUBBELL, New York. The paper embodied reports of eighteen cases of unilateral inflammation of the optic nerve and retina. Four cases were unilateral optic neuritis, four were unilateral neuro-retinitis, and ten were unilateral retinitis. In some the inflammation was mild, in others, it was severe. The milder cases recovered more or less completely, while vision of the affected eye was lost or nearly lost in the more severe cases. No definite relation to other diseases could be established in most of the cases. Iodide of potassium was commonly given. Some cases seemed to be improved by it, while others were not benefited at all.

Dr. Eugene Smith, Detroit, had long since been convinced that the apparent silence on the part of text-books and journals concerning this matter was only relative. He fully agreed with Dr. Hubbell that these cases were decidedly more common than was generally supposed. He had had recently four cases of unilateral neuro-retinitis under observation. Dr. J. P. Herron, Jackson, Tenn., had, after reading Dr. Hubbell's paper, found in his records four cases which he had had under observation since March first. He was inclined to attribute the frequency of these cases to malarial toxæmia. His four cases were described in detail. Dr. J. A. Patterson, Colorado Springs, said intranasal

complications as a cause of these conditions must not be overlooked, and that patience and skill in examining the nose was required before this possibility could be excluded. Dr. Wendel Reeber, Philadelphia, since reading Dr. Hubbell's paper, had gone over his records and found in the last year three cases of undoubted uniocular optic neuritis. He did not think it a very rare phenomenon. He called attention to the use of chloral in these cases, which acted by producing a cerebral anæmia. Dr. A. R. Baker, Cleveland, had some years ago reported to the Society a case of retinitis circinata in one eye with the other eye normal. He called attention to the danger of examining one eye and taking it for granted that the other was all right. Dr. C. J. Kipp, Newark, N. J., called attention to a class of cases which seemed to be primary optic neuritis and which were not, in which there is a circumscribed retinitis so close to the disk that you cannot separate it, giving an appearance of choked disk until the disease has run its course. The only way to distinguish this condition was to look for deposits on Descemet's membrane.

Dr. E. E. Holt, Portland, Maine, had seen a number of instances of optic neuritis in one eye without appreciable diminution in vision. He thought the condition rather common. Dr. S. D. Risley, Philadelphia, emphasized the danger referred to by Dr. Kipp of mistaking cases of retino-choroiditis for optic neuritis. He was inclined to think uniocular neuritis of less grave import than binocular. He had not been able to determine any general etiology for the occurrence of uniocular neuritis. Dr. W. H. Wilder, Chicago, did not think the condition should be regarded as a disease entity. He thought an explanation might be found in the anatomical asymmetry so frequently seen in the body; there might be asymmetry of the optic nerve. There might be arteriosclerosis affecting the vessels of one eye and not the other. Dr. George E. de Schweinitz, Philadelphia, classified cases of unilateral optic neuritis into four groups: first, unilateral optic neuritis due to brain tumor and other intracranial causes; second, that due to certain well-known infections; third, that due to local causes, the optic foramen or the contiguous sinuses; fourth, that due to conditions associated with the vascular supply, as arteriosclerosis. He agreed with Dr. Wilder's explanation which determined for anatomical reasons a unilateral instead of a bilateral neuritis, and considered it not a disease entity but a local manifestation.

Dr. Melville Black, Denver, called attention to the value of the estimation of blood pressure in these cases and said that where the tension is high its reduction by proper medication would do much towards bringing about recovery. Dr. A. A. Hubbell, Buffalo, in closing the discussion, agreed with most of the suggestions that had been made, particularly those of Dr. Wilder and Dr. de Schweinitz.

Retrobulbar optic neuritis following childbirth. Dr. C. J. KIPP, Newark, N. J. The writer reported two cases. Case I. An attack of retrobulbar neuritis of right eye following four successive childbirths. No albuminuria. During attack following third pregnancy, part of eyelashes and part of hair of brow in line with supraorbital nerve turned white, and the hair growing in this situation has been white ever since. Total blindness of right eye followed fourth pregnancy. The optic neuritis was attributed to a disturbance of vascular supply at or near the apex of the orbit. The absence of pigment in the hair was thought to be caused by a change in the hair-papillæ, whereby the supply of pigment to the hair-shaft was interrupted, this being due to some disturbance in the nerves supplying the papillæ. Similar changes had been observed to follow sympathetic ophthalmia, but none so far after optic neuritis. Case II. One of retrobulbar optic neuritis of one eye after first childbirth. There was eclampsia but no albuminuria. Restoration occurred after many months.

Dr. George S. Derby, Boston, said in discussion, that about a year ago he published a paper on this subject, going over the literature very thoroughly, and he had gotten the impression that no definite etiology could be attached to these cases. Dr. Nelson M. Black, Milwaukee, thought that in the first case the supraorbital neuralgia pointed strongly to the possibility of disease of the sinuses.

Dr. C. J. Kipp, Newark, said, in closing, that the cases referred to by Dr. Derby were attributed to lactation. The cases reported had followed every pregnancy for four successive pregnancies.

WEDNESDAY MORNING, JUNE SIXTH.

Bacteriology of the eyelids. Dr. JOHN S. DERBY, Boston. The writer considered the influence of location and of anatomic peculiarities; the influence of the ordinary pus organisms in diseases of the lids, furuncle, erysipelas, abscess, cellulitis,

hordeolum, and blepharitis; the diseases caused by the various specific bacteria, tuberculosis, leprosy, and the like; and the diseases due to animal parasites, as pediculosis, cysticercus of the lids; and diseases due to vegetable parasites, such as ring-worm and favus, giving a complete résumé of the literature on the subject.

The pathogenic bacteria of the conjunctiva. Dr. EDWARD A. SHUMWAY, Philadelphia. The writer considered the established facts concerning the bacteriology of conjunctivitis, and said the same form of conjunctivitis may be caused by different organisms, and that one organism may cause different forms of conjunctivitis. The general morphology was now generally settled. The special organisms, such as the Koch-Weeks bacillus, diplobacillus, pneumococcus, gonococcus, diphtheria bacillus, xerosis, staphylococci, streptococci, and the rare organisms were all considered.

The pathogenic and pyogenic bacteria of the eyeball. Dr. JOHN E. WEEKS, New York. This paper considered the various micro-organisms that affect the cornea, the sclerotic, the iris, lens, vitreous humor, ciliary body, retina, choroid, and optic nerve, and the lesions that they produce. The peculiarity of direct and secondary, of primary and metastatic, invasions of the various parts of the eyeball by various organisms was discussed.

In discussion, Dr. Robert L. Randolph, of Baltimore, called attention to the bacillus coli communis as sometimes producing inflammation of the eye, and said it had been demonstrated in the interior of the eye in panophthalmitis. Dr. E. V. L. Brown, of Chicago, considered that Dr. Derby had thoroughly covered the subject of his paper, and that in the future it would be a place to which to refer for the literature of the subject. Dr. Wm. C. Posey referred to the various types of conjunctivitis caused by the diplobacillus of Morax-Axenfeld, and said the inflammation was not as active as that occasioned by the pneumococcus. Iritis with synechia and hypopyon were not uncommon. The most common type of ulceration of the cornea excited by the diplobacillus occurred in the form of a disk-like infiltration of the superficial layers of the central portion of the cornea. The inflammation excited by the diplobacillus, the speaker said, yielded readily to applications of zinc. Dr. George S. Derby, Boston, said that in seventy-eight cases of conjunctivitis examined

at the Eye and Ear Infirmary the diplobacillus had been found seven times in pure culture. Dr. Edward Jackson, Denver, referred to an epidemic in the spring of 1904 originating in Denver, and said in reference to corneal involvement that he had seen only one severe case due to the diplobacillus and that it yielded readily to the zinc treatment. Dr. C. D. Wescott, thought that many American patients resisted the zinc therapy, and that some would tolerate zinc ointment who would not tolerate the solution. Dr. C. W. Hawley, of Chicago, in an epidemic had used antipyrine successfully. Dr. Wm. M. Sweet, Philadelphia, had made spreads and cultures in thirty-one cases of conjunctival and corneal disease and found the diplococcus present in six cases. The zinc sulphate, one grain to the ounce, was the only treatment to which they responded. Dr. Chas. H. Williams, Boston, had found the soda idolate of zinc beneficial in these cases, especially when combined with chlorotone. Dr. Nelson M. Black, of Milwaukee, had noticed that in these cases the patients almost invariably complained of symptoms closely related to those of refractive errors showing the importance of bacteriological examination in many refractive cases. Dr. E. V. L. Brown, Chicago, spoke of a case of bacillus subtilis infection following a penetrating wound of the sclera in which a pure culture of the bacillus subtilis was obtained. Dr. Brown Pusey, Chicago, thought that the failures with the zinc treatment were due to the fact that the treatment was not persisted in long enough. Dr. Edward A. Shumway, Philadelphia, said that Axenfeld in his last article concludes that the diplobacillus has a capsule which is demonstrable by special staining methods.

The staining and examination of the bacteria of the eye by simple, practical methods. Dr. EDGAR S. THOMPSON, New York. The paper describes simple and practical methods of preparing film preparations, methods of staining, counter staining, and decolorization. The examination of the gonococcus in fresh smears, the diplococcus of meningitis, the Koch-Weeks bacillus, the Morax-Axenfeld diplobacillus, the Klebs-Loeffler bacillus, the pneumococcus, xerosis bacillus, the methods of preparing scrapings from the conjunctiva and cornea, and of making tissue sections were discussed.

Dr. Brown Pusey, Chicago, presented microscopes and slides for demonstrating about twenty-five forms of bacteria which

invade the eye, and in discussing the paper suggested that the title be changed to read "The Staining and Examination of the Bacteria of the Eye by Accurate Methods," as he thought accuracy in the examinations more important than ease and rapidity. Dr. Arnold Knapp, New York, thought the bacillus of influenza would be found more frequently in these cases if proper culture media were used. He referred to the necessity of making cultures as well as smears in the examination for the diphtheria bacillus. Dr. George S. Dixon, New York, agreed with Dr. Knapp that a diagnosis should never be made of diphtheria without a cultivation. Dr. John E. Weeks, New York, emphasized the necessity for the staining of secretions and the examination of smears in cases of conjunctival disease as clinical examination alone was not sufficient in a great many cases. Dr. E. L. Meierhof, New York, thought that unless one was constantly cultivating this work his bacteriological examinations would be very unsatisfactory. Dr. Brown Pusey, Chicago, protested against turning the examinations over to some one else, and thought it behooved the man treating the case to find out for himself the cause and nature of the disease.

Physical economics. Dr. E. E. HOLT, Portland, Me. This paper dealt with a mathematical formula for the normal earning ability of the body, by which, with the requisite data, a person may be either rated or his economic value may be ascertained, and thereby damages to his body from injury or disease, with an indemnity to be allowed therefor, may be determined in a manner equitable to all concerned. When called on to ascertain damages to the eyes from an injury, an oculist frequently met with other disabilities which occurred at the same time. If he worked in connection with other physicians and surgeons who were to determine damages to other parts of the body, it was highly important that there should be standard methods of procedure which could be applied to every system and organ of the body so that each might understand the other and work together to obtain results on a scientific basis. Methods by which this might be accomplished were demonstrated.

Dr. H. V. Wuerdemann, Milwaukee, said that there was a remarkable similarity of results obtained by these methods to the damages given in several hundred damage suits that he had collected. He thought that we needed statistics on the subject,

and that each one should contribute to the literature one or more cases showing the amount of earning capacity after a certain accident, as it was only by such evidence that we would be able ultimately to exactly determine the percentage of loss of earning ability following a given accident. Dr. L. W. Fox, Philadelphia, said it was very desirable to have some such system by which we could form an opinion to place before the courts when called upon. Dr. Edward Jackson, Denver, thought that functional ability was the foundation of the whole subject and would have to be settled by our united statistics, and the members should consider the cases that come to their notice with reference to this point so that we could have a basis for making these formulæ of greater value.

Some unusual ocular manifestations of arteriosclerosis.

Dr. WM. ZENTMAYER, Philadelphia. The paper reported a case of optic atrophy, one of periodic transient total blindness of both eyes followed by prolonged obscuration of the inferior field of vision, developing into permanent total blindness of this area, with atrophy of the upper half of the papilla, shrinking of the corresponding vessels, and evidence of sclerosis of all the retinal vessels of one eye. Secondly, a case of monocular visible spasm of the central artery of the retina. There was repeated opportunity of studying the fundus during an attack, and the author gives a description of the phenomena witnessed.

WEDNESDAY AFTERNOON, JUNE SIXTH.

A demonstration of the fundi of some birds, with remarks on their eyes and eyesight. Dr. CASEY A. WOOD, Chicago. This consisted of an exhibition with the opaque projector and stereopticon of a series of drawings, showing the anatomic and physiologic characteristics of the fundi of some birds.

Relations of the superior and inferior recti muscles to convergent squint. Dr. EDWARD JACKSON, Denver. The writer said, as the eye is turned inward the power of the primary adductor, the internus, diminishes. But the superior and inferior recti, attached in front of the centre of location of the eyeball, have their insertions carried inward, so that they gain more and more power to turn the eye in or hold it in convergence. This makes these muscles, or rather nasal portions, of

great importance in convergent strabismus. A case reported illustrated the permanence of results obtained by extended tenotomy. The primary adductor and abductor, the internus and externus, tend to equilibrium with the eye directed forward. The secondary adductors, the superior and inferior recti, and the secondary abductors, the obliques, tend to turn the eye ever more strongly in or out. A rational operation to correct excessive convergence must tend to lessen the relative influence of the secondary adductors.

Dr. Francis Valk, New York, did not believe that nature ever placed a muscle in the human economy to perform two or three different functions; they had but one function, and if cases of squint were studied on that principle, operations would be more successful. Dr. G. C. Savage, Nashville, thought we should not forget that there were two purposes in view in operations on the muscles: one to increase or lessen the tonicity of the muscle; and the other to change the plane of its action. The tonicity of a muscle should always be taken into consideration before operating upon it. He thought Dr. Jackson had placed a dangerous precedent before us. Dr. M. D. Stevenson, Akron, Ohio, thought there was no muscle attached to the eye that had not three different movements, which he demonstrated by drawings on the board. Dr. Frank Todd, Minneapolis, thought there might be certain cases in which this might be valuable—where measurements showed an excess of rotation inward and no defective rotation outward. Dr. John A. Weeks, New York, protested against the operative procedure as not only weakening the internus and the secondary adductors, but also the externus. He thought it dangerous to advocate an operation so pregnant of evil. Dr. Miles Standish, Boston, considered the method a very good one and had done some operations with entire success in analogous conditions.

A study of convergence and its defects, including an analysis of four hundred and forty-one cases of exophoria.

Dr. WENDELL REBER, Philadelphia. The paper considered the evolution of binocular vision; evolution of convergence as a separate act; ontogeny and phylogeny of convergence; analysis of the act of convergence. It gave an analysis and statistic arrangement of 433 cases of exophoria. It considered exophoria not a passive condition, but a reversion to the next lower type

(that is to say, an atavistic phenomenon). The author draws twenty-three conclusions relative to the symptomatology and treatment of exophoria.

Dr. Edward Jackson, Denver, agreed with the author's conclusions as to treatment in the order in which they were given; right living, careful refraction, convergent training, prisms (bases in) for infinity, prisms (bases in) for reading-glasses only, tenotomy or advancement. With reference to exophoria and age he also agreed with Dr. Reber that it becomes more common with increasing age. He thought low degrees of exophoria extremely common. Dr. Alexander Duane, New York, preferred the cover test (measuring the deviation with prisms) in testing exophoria for near. He was opposed to the use of prisms for constant wear, because while serviceable for a time they seemed in the long run to be detrimental. Dr. G. C. Savage, Nashville, said that no test of the lateral muscles was reliable when made under the influence of the mydriatic, as the relationship between convergence and accommodation was such that if you take away the accommodative power you destroy the converging power and do not get reliable results. Dr. Oscar Wilkinson, Washington, considered that there was a certain class of cases where one never got more gratifying results than with the use of prisms. He did not believe that exophoria increased under the use of prisms.

Some axioms concerning ocular rotations. Dr. G. C. SAVAGE, Nashville. The papers submitted the following axioms: 1, a loose, well-fitted convex sphere in a fixed concave sphere may be rotated on any diameter; 2, the axis of rotation must be at right angles to the plane of rotation; 3, the centre of curvature is the centre of rotation; 4, no single diameter must lie in every rotation plane; 5, the eye has a single diameter (the visual axis), which is common to all planes of rotation; 6, centre of macula is posterior pole of eye; 7, centre of rotation is centre of retinal curvature; 8, all axes of rotation lie in the equatorial plane at right angles to all meridional planes; 9, plane of horopter must contain the two visual axes, the two centres of rotation, and the two horizontal retinal meridians; 10, axis of horopter plane connects the two rotation centres; 11, eyes not level must be torted in direction of lower eye; 12, every line of direction is a radius of retinal curvature prolonged.

This paper was discussed by Dr. George H. Price, Nashville, Dr. M. D. Stevenson, Akron, Ohio, Dr. F. H. Verhoeff, Boston, and Dr. Lucien Howe, Buffalo.

Ophthalmic practice of the present time. Dr. FRANCIS VALK, New York. The author considered that the study of refraction and motility of the eyes should not be according to any special method or follow any special teachings; that all objective methods of examination were essential in refraction and motility; that heterophoria was a well-established abnormal condition of the motility of the eyes and should be corrected either by glasses or operation; that cases of refraction not relieved by glasses might not be failures if examined as to motility.

Dr. A. E. Prince, Springfield, Ill., had found so many cases of asthenopia accompanied by small errors of refraction and little or no muscular imbalance that he designated them "atonic asthenopia," and found that they were nearly always caused by unwise use of the eyes. For these cases he advised work at normal range with an interruption every five minutes by ten seconds' rest. He favored advancement as an operation in heterophoria or strabismus. Dr. Oscar Wilkinson, Washington, believed that the use of homatropin would often fail to bring out what he termed astigmatic accommodation, and atropin should be used. Dr. G. M. Gould, Philadelphia, advocated an endowed and recognized optical refraction school as none of the profession seemed to agree with one another in their prescriptions for glasses. Dr. Leartus Connor, Detroit, disagreed with Dr. Gould and said that he met every day with work of his fellow ophthalmologists with which he absolutely agreed, and he did not think there was any need for a school to teach refraction.

Conjugate lateral deviations. Dr. J. H. CLAIBORNE, New York. The paper referred to the associate or conjugate movements of the eyeballs, reviewed the literature bearing on associate deviation as a symptom of apoplexy. It considered the conjugate lateral deviation caused by primary nuclear disease; vertical form of conjugate deviation; the cross fibres passing from nucleus of sixth nerve to nucleus of third nerve on opposite side; the existence of these fibres necessitated by symptoms and signs in nuclear paralysis. It referred to the demonstration of their existence by Graux, and reported two cases observed by the author, one probably from cortical irritation, the other probably

from a nuclear lesion. The author presented a rearranged scheme to indicate the position of lesion by the direction of the eyes.

Dr. M. D. Stevenson, Akron, Ohio, said that muscular spasms due to irritation, and paralysis due to destruction, furnished the same local diagnosis; that paralysis might be due to a peripheral nuclear or central lesion; that conjugate paralysis must be nuclear or central. In nuclear paralysis there was suspension of voluntary and involuntary movements, and nerve and muscle degenerate at an earlier or a later period. Convergence was supposed to be controlled by a central collection of nerve nuclei common to both sides, whereas the internal rectus in conjugate movements of both eyes was controlled by a collection of nuclei connected with the nucleus of the opposite sixth nerve. Dr. Alexander Duane, New York, agreed with Bernheimer that there is no anatomical foundation for Graux's view, and thought the clinical facts better explained by the actual anatomical conditions.

Incurable eyestrain. Dr. GEORGE M. GOULD, Philadelphia. The author said that it was sometimes impossible to relieve eyestrain, because impossible to reach causes. This should be understood, so that (1) the occupation and use of the eyes may be regulated to lessen symptoms; (2) that other physicians may not err in treatment which cannot reach the causes. Causes of incurable eye-strain: (1) certain congenital anomalies, such as albinism, colobomata, and malformations which render the eyes optically imperfect; (2) some high degrees of ametropia; (3) the sequels of inflammatory disease, traumatisms, etc; (4) amblyopia or other incurable injuries resulting from uncorrected ametropia, loss of accommodation, subnormal accommodation, etc.; (5) heterophoria or heterotropia of too long standing to be relieved by the ordinary methods; (6) interruptions or contradictions of the normal co-ordinations of dextrocularity and dextromanuality; (7) incurable cerebral or nervous diseases such as paralysis, paresis, myosis, nystagmus, tremor; (8) diseases, rarely, of the general system or adjacent organs; (9) unhygienic use, overuse, or abuse of the eyes which we cannot stop.

Dr. Peter A. Callan, New York, deprecated that Dr. Gould totally ignored or slurred over the operative side of ophthalmology. He did not agree with the writer that lack of proper

fitting glasses was productive of cataracts. Dr. George M. Gould (closing the discussion) said that Dr. Risley had long contended that cataracts were due to choroidal disease, and he believed that choroidal disease might be due to eye-strain. He had never seen a case that had worn proper glasses that had developed cataract [!!—EDITOR].

THURSDAY, JUNE SEVENTH, MORNING SESSION.

Some personal experiences in the use of electricity in ophthalmic practice. Dr. W. FRANKLIN COLEMAN, Chicago. The paper treated chiefly of chronic cases, usually intractable, with inflammatory exudates and functional or organic disease of nerve tissue. Phenomenal recoveries, other therapeutic means having failed, demonstrated that electricity can favorably modify tissue changes which medication is powerless to effect. Superior electrolytic effect of galvanism indicated its use where exudates formed the chief pathologic factor. The writer said that no disease seemed to yield more certainly and completely to this treatment than vitreous opacity. The sinusoidal current is used in primary optic atrophy; there was improvement in 66 per cent. of cases. In muscular paralysis the interrupted galvanic current was used as it produced more profound contraction than the faradic, while it furnishes the electrolytic and nerve stimulating effects which the latter lacks. Contrary to the view of most oculists, the author believed that his experience aids in demonstrating that electricity has justified its claim to usefulness in ophthalmic practice.

Dr. S. L. Ziegler, Philadelphia, thought it unfortunate that electricity, which was accomplishing so much in neural therapeutics, should be looked upon with skepticism by the ophthalmologist. He thought that the evidence should convince every careful and unbiassed observer that electricity should be accorded a most honored position in ocular therapeutics. Dr. Leartus Connor, Detroit, thought that as a general thing the use of electricity had been disappointing, and that it took up too much of the time of both patient and physician. Dr. Lucien Howe, Buffalo, asked if there were any statistics where the same condition existed in both eyes and the treatment was applied to one and not the other. Dr. H. V. Wuerdemann, Milwaukee, said the high-tension galvanic current was of great value in securing absorption of exudates within the eyeball in cases of choroiditis

and uveitis, and for stimulation of nutrition in cases of partial optic-nerve atrophy. Dr. E. J. Brown, Chicago, reported a case of amblyopia improved after three weeks' treatment. Dr. George F. Keiper, Lafayette, suggested the human finger as the best electrode, allowing the current to pass through the body by the finger into the patient's eye. Dr. W. F. Coleman, Chicago, in closing the discussion, said that his cases had been chronic cases, while Dr. Ziegler had referred to acute cases. He gave a word of warning as to the use of the graphite rheostat, that made of a combination metal being much better.

The X-ray in ocular therapeutics. Dr. G. ORAM RING, Philadelphia. The essayist considered the question of the application of Roentgen therapy in superficial epithelioma involving the eye and ocular adnexa, rodent ulcer, carcinoma, orbital sarcoma, trachoma, vernal conjunctivitis, and a few other forms of ocular disease. He reviewed the literature on the subject and the previously unpublished opinions of well-known ophthalmologists, and concluded that it made a great advance in the treatment of superficial epithelioma and rodent ulcer, and would usually effect a cure; if unsuccessful, then electro-chemical sterilization could be used, and finally excision; X-ray treatment had proven of value in the more extensive orbital carcinoma, but it was conceded that the deeper the growth the less favorable the result; it exerted an anodyne influence on malignant disease of the eyelids and orbit; progress in the treatment of trachoma had been effected by the X-ray therapy; evidence indicated its value in vernal conjunctivitis.

Dr. George S. Dixon, New York, considered the paper a very valuable contribution to the subject. He had been forced to the conclusion that the earlier ideas must be toned down considerably. His experience with epithelioma of the lids had not been satisfactory, and he cited a number of cases. Dr. W. F. Coleman, Chicago, had had good results in trachoma. Dr. Charles S. Bull, New York, thought it the most valuable remedy we had in the treatment of superficial carcinomata; the deeper the disease became, the less value, in his opinion, was this treatment. Dr. John E. Weeks, New York, referred to the tolerance of the retina to the X-ray; it was not affected apparently. Dr. Edward Jackson, Denver, had had a case of recurrent epithelioma of the lid, recurring within a few months after excision, treated with

the X-rays that had now been free from evidence of disease for five years. As to trachoma, he thought the bad cases that had shown resistance to other methods had not been benefited by the X-ray. Dr. A. R. Baker, Cleveland, had had a number of cases of epithelioma in which the X-ray had brought about recovery. He had had several cases of sarcomatous tumors involving the sinuses in which there was no benefit except the relief of pain. Dr. John Green, Jr., St. Louis, had had recently under observation a woman of sixty-five, operated upon thirteen years ago for mammary cancer; about two years ago the disease recurred at the inner angle of the right eye; under X-ray treatment the tumor had subsided. Dr. K. C. A. Wood, Chicago, referred to a case of secondary glio-sarcoma. He advocated the use of the X-ray treatment as a relief for pain. Dr. C. D. Wescott, Chicago, cited a case of sarcoma of the orbit in which the ray was used three months with recovery. Dr. W. B. Marple, New York, in a case of recurring sarcoma in which an exenteration of the orbit was done, and the X-ray applied to the orbital tissues, had found no effect as to the recurrence of the sarcoma. Dr. Wm. Sweet, Philadelphia, referred to the necessity for drainage for the tissue destroyed by the X-ray, as otherwise patients might develop septicæmia. He thought the use of the X-ray in the treatment of trachoma a waste of time. Dr. L. W. Fox, Philadelphia, had had good results in the epitheliomata; no results in the treatments of trachoma. Dr. C. L. Leonard, Philadelphia, said that in the deeper growths we were not able to secure results; we could hardly expect to reach the deep-seated growths that had already produced metastases. Dr. D. L. Edsal, Philadelphia, referred to the general effect upon metabolism and possibilities for harm of the X-ray; he considered the X-ray one of the most violent therapeutic measures we have, and thought it should be used with great care.

Ocular injuries from foreign bodies, with a report of four hundred and twenty cases. Dr. Wm. M. SWEET, Philadelphia. The writer considered the importance of early diagnosis by the Roentgen rays in every eye with lowered vision following injury by a foreign body: the results of magnet extraction of iron or steel from the vitreous through an incision in the sclera; the rarity of retinal detachment as a direct result of operation; magnet extraction complicated by fibrinous exudation surrounding

the metal in old injuries; traumatic irido-cyclitis following frequent insertions of the magnet point into the vitreous; the percentage of eyeballs lost from panophthalmitis was small; large number of traumatisms with lodgment of the body in the eye; the successful cases of extraction that have retained useful vision for many years.

Dr. Howard F. Hansel, Philadelphia, advocated the procedure of localization before use of the magnet, and subsequent extraction through the cornea of bodies situated in the lens or anterior to it and through an opening in the sclera for those posterior to the lens, but he did not believe localization indispensable to the successful management in many cases. In cases of recent injury he thought it safer to allow non-magnetizable particles to remain in the eye, unless easily accessible, rather than probe the vitreous with forceps or other instruments. Dr. J. Ranly, Cincinnati, had devised a method of attaching a flexible extension arm to the magnet which could be moved in any direction. Dr. W. F. Coleman, Chicago, had devised an arrangement with a ball-and-socket joint which permitted of movement in any direction. He did not advocate Haab's method of removing the foreign body through the anterior chamber. Dr. Frank Todd, Minneapolis, had practised Haab's method and been surprised at the ease with which it could be used; he thought it had certain advantages over removal through the sclera where the body could not be observed. Dr. S. D. Risley, Philadelphia, said we should differentiate between injuries resulting from the foreign body itself and those caused by efforts for its extraction. He deprecated the idea of removing the foreign body by making a new path through the vitreous, thereby increasing the possibility of infection; it should be extracted by the shortest possible path, as indicated by localization. Dr. Wm. H. Wilder, Chicago, deprecated the practice of using the magnet at once to make a diagnosis of foreign body in the eye; he thought a radiograph should be made first, and probably with a localizing apparatus.

Dr. Edward Jackson, Denver, referred to a case in which a splinter of steel had caused a wound in the cornea, anterior capsule, and posterior capsule; extracted with the Johnson magnet through the sclera, followed by clearing up of the lens.

Auto-intoxication in relation to the eye. Dr. GEORGE E. DE SCHWEINITZ, Philadelphia. This paper reviewed the modern ideas

on the subject and considered the toxins produced by intestinal decomposition; the relationship to certain diseases of the cornea, sclera, and uvea; the possible relationship to amblyopia and retrobulbar neuritis, acute and chronic. He said toxins may be accessory causes and the means by which the symptoms are continued, even when the well-known exciting cause has ceased to be operative. He went over the researches of Dr. Edsal and his own in regard to the relationship of enterogenous decomposition-products to the development and continuance of so-called toxic amblyopia when this is produced by tobacco and alcohol. The probable relationship of auto-intoxication to certain post-operative phenomena, notably post-operative delirium, iridocyclitis, and glaucoma. Many illustrative cases were quoted. The writer said that great reserve was needed in attributing these cases to auto-intoxication, but it should not be forgotten in their clinical study. Accurate chemical analysis of the urine secretions under all the conditions named was necessary.

Dr. Casey A. Woods, Chicago, thought that Dr. de Schweinitz's work offered an explanation for a great many obscure conditions in the eye. He referred to the possibility of carrying these experiments further with monkeys instead of dogs. Dr. Chas. S. Bull, New York, thought that too little attention had been given to the connection existing between certain obscure diseases of the eye and intestinal auto-intoxication. He had seen a number of cases within the last few years in which the gastro-intestinal factor had been the sole contributing cause.

Dr. W. B. Marple, New York, agreed with Dr. Bull as to the connection between these obscure diseases of the eye and auto-intoxication, and referred to several illustrative cases. Dr. Wm. C. Posey, Philadelphia, referred to two cases in which auto-infection was the causal factor and in which the patients improved on proper diet and eliminant treatment. Dr. John E. Weeks, New York, referred to two cases, one of neuritis and one of retinitis due to auto-intoxication, which cleared up under the use of intestinal antiseptics. Dr. S. D. Risley, Philadelphia, said that the comforts of the patient and the removal of trouble in some of these cases by attention to the gastro-intestinal tract were amazing. Dr. Edward Jackson, Denver, mentioned a case of amblyopia and commencing optic-nerve atrophy that cleared up after attention to the gastro-intestinal tract. He had also had three cases of chronic relapsing iritis that responded only to this

treatment. Dr. John Green, Jr., St. Louis, reported a case of glaucoma simplex that recovered only after attention had been paid to the gastro-intestinal intoxication.

The eye injuries of Independence Day. Dr. ROBERT L. RANDOLPH, Baltimore. At the Atlantic City session he had called attention to the frequency of eye injuries on Independence Day. Ophthalmologists probably see more such cases than other physicians, for wounds of other parts of the body are treated by physicians, while eye injuries are treated by a limited few in the larger cities and towns. Their observations had suggested the taking up of the subject by ophthalmologists with the view of making it punishable by a fine either to sell or to set off fireworks in the city. Great improvement in the condition of affairs had been brought about in Baltimore with the help of the newspapers and co-operation of the police department.

Dr. G. C. Savage, Nashville, discussing this paper, thought that any laws regarding this subject should apply to all holidays as well as to Independence Day, and said that in his part of the country there had been more injuries of this kind on Christmas Day than on the Fourth of July. At the present time, however, no fireworks were allowed on the street on any holiday.

Injuries of the eye with bird shot. Dr. W. B. MARPLE, New York. The paper reported two cases of double perforation of the eyeball from bird shot. The necessity of depending on the skiagraph in estimating the prognosis was insisted upon. The prognosis depended not only on the location of the injury, but on whether one or more shot are lodged within the eyeball, or have passed through the eyeball and from their location in the orbit produced pressure symptoms and impairment of function. The writer said that shot coming from a gun are usually sterile and the lead in itself is not apt to set up irritation. He thought that the wound in the eyeball should not be probed, and an effort should be made to keep out infection.

Dr. Geo. E. de Schweinitz, Philadelphia, agreed with Dr. Marple as to the importance of X-ray examination in these cases, particularly for the purpose of ascertaining whether or not the shot had remained within the globe or passed through into the orbital tissue. If infected irido-cyclitis was present, he thought enucleation in most instances would be required. Dr. H. V. Wuerdemann, Milwaukee, said that lead shot were not only aseptic but antiseptic, which accounted for the few infected

wounds of shotgun injuries. He was of the opinion, however, that all eyes containing bird shot, and having little or no vision, should be enucleated for the reason that they later undergo changes that demand enucleation. Dr. Edward Jackson, Denver, referred to the difficulty of extracting bird shot from the eyeball, the shape of the shot preventing it from becoming fixed, so that it moves away from the instrument. Dr. Robert L. Randolph, Baltimore, thought that experiments had shown that bird shot are not always aseptic. Dr. S. D. Risley, Philadelphia, could not recall a single instance in which infection had followed injury to the eye from bird shot, but chemical changes take place which had proved serious and required removal of the eyeball. Dr. Chas. H. Beard, Chicago, advocated the removal of the shot when within the anterior chamber. Dr. Wm. Sweet, Philadelphia, called attention to the necessity for considering the diameter of the eyeball, as to whether 24 or 26mm, in localizing these foreign bodies.

THURSDAY, JUNE SEVENTH, AFTERNOON SESSION.

Exhibition, by means of the new opaque projector, of original colored ophthalmoscopic drawings. Dr. CHAS. H. BEARD, Chicago. This series of pictures referred mainly to the so-called physiologic or congenital fundus anomalies. First was shown the normal fundus, and certain peculiarities in connection with it were described. Then followed anomalies of the optic nerve, of the retina, and of the choroid in succession, or of two or more of these combined. As occasion offered, the pathologic appearances were shown that are apt to be mistaken for the physiologic, and the distinguishing features were pointed out.

The ripening for immature senile cataract: its place. Dr. FRANK C. TODD, Minneapolis. The author discussed the conditions under which the ripening operation is justifiable, as compared with the extraction of immature senile cataracts. The opinions of many ophthalmologists in the United States were quoted and answers to circular letters were given. The writer concluded that if we grant the success and safety claimed by those of much experience in irrigation, the operation of ripening is indicated: (1) in case of immature cataract (not mentioned as contra-indicated), in which a preliminary iridectomy is to be performed; (2) in those patients who would not be likely to behave well during the extraction, thus preventing the operator

from performing much toilet or from practising irrigation. If irrigation is not practised, trituration of the lens would be indicated in all patients with immature senile cataract under sixty, in whom, for reasons mentioned, relief is required.

Some important considerations in the extraction of cataract. Dr. MARK D. STEVENSON, Akron, Ohio. The writer considered the necessity of thorough examination and preparation of the patient and gave description of screens for the patient's and operator's breath and saliva. He advocated the large, completely bordering conjunctival flap which is easily folded on the cornea, described the method of obtaining it, the position and size of the sclero-corneal incision, where to grasp the iris when withdrawing it, and described the advantages of sphincterotomy over the simple operation, sphincterectomy, iridectomy, or peripheral buttonhole in iris.

Cataract extraction with modified iridotomy. Dr. F. H. VERHOEFF, Boston. The operation advocated by the writer consisted essentially in making a buttonhole at the root of the iris and incising the iris from this opening to the pupil by means of iris scissors. The lens is then extracted in the usual way or in its capsule. The operation offers the advantages of both the simple and combined operations without their disadvantages, according to the opinion of the writer. The lens, he said, is removed with the same ease as in the combined operation and cortical matter is readily expressed. The excision of iris tissue is made where it will be most effective in preventing iris prolapse and at the same time do the least damage from an optical standpoint.

The use of the secondary cataract knife. Dr. MELVILLE BLACK, Denver. The writer described a probe-pointed secondary cataract knife which he presented. It is fashioned after a Graefe knife, except that it has a probe point. Mackenzie, he said, used a probe-pointed secondary knife more than fifty years ago, but of late years it had fallen into disuse. The knife was used by the author for enlarging the angles of the wound when found to be too small, or for making dissection when the anterior chamber is evacuated before a counter puncture is made, and for completing dissection when the iris has fallen in front of the knife before the section is finished.

In discussion, Dr. M. Wiener, St. Louis, advocated Major

Smith's method of removing the lens in capsule. Dr. A. E. Bulson, Jr., Fort Wayne, in discussing Dr. Stevenson's paper, said that the pre-operative attention and precautions recommended by the essayist were excellent from a theoretical standpoint, but in practice were apt to increase unnecessarily the anxiety of the patient, and he questioned if so much attention was indicated. He advocated the wearing of a strip of folded gauze over the mouth and nose to prevent possible infection from the breath, and the covering of the head with a sterile cap to prevent infection from the hair. He advocated the use of artificial condensed light. For the average operator he thought the combined operation the easiest to perform, and that, all things considered, it gave the best results. Dr. Allen Greenwood, Boston, in discussing Dr. Verhoeff's paper, said the operation advocated was an extension of the buttonhole operation devised by Chandler for preventing iris prolapse. He did not agree with the essayist that the operation combined all the advantages of both the simple and combined operations without their disadvantages, and thought that a small iridectomy was just as effective. Dr. Casey A. Wood, Chicago, in discussing Dr. Black's paper, advocated the use of the knife in cases where the iris fell over the blade, rather than attempting to turn the blade of the Graefe knife. Dr. L. Webster Fox, Philadelphia, thought the knife devised by Dr. Black would be very useful in many cases. Dr. Oscar Wilkinson, Washington, referred to the use of a blunt-pointed knife in cataract operations, described by Dr. F. Bischoff, London, in 1793, in his little book entitled, *A Treatise on the Extraction of Cataract*. Dr. Wendell Reber, Philadelphia, advocated the combined operation for cataract extraction, and deprecated the use of Major Smith's operation. Dr. S. L. Ziegler, Philadelphia, advocated the use of the keyhole iridectomy as being the best. Dr. A. R. Baker, Cleveland, thought that most of the older operators had abandoned the ripening operation. Dr. C. W. Hawley, Chicago, had done a number of ripening operations with success. He would not attempt to extract in the capsule. Dr. W. B. Marple, New York, in speaking of Dr. Black's knife, said that some cataract knife might be inserted upside down, but there was little difficulty in turning it. Dr. E. E. Jack, Boston, had done nine or ten extractions in capsule none of which had been failures. Dr. E. E. Holt, Portland, thought the older operators had abandoned the ripening of immature cataracts, although

every one might do it in certain cases. In the preparation of the patient he advocated the use of bromide of potassium or morphia the night before.

The value of myotics in the treatment of chronic simple glaucoma. Dr. WM. CAMPBELL POSEY, Philadelphia. This paper was a plea for the continuous and intelligent use of myotics in the treatment of chronic glaucoma, and referred to their great value in this class of cases notwithstanding the generally accepted view of their comparative uselessness. The writer spoke of the desirability of their continuance in the early stages, even when the diagnosis of glaucoma had been confirmed. He reported a case showing remarkable preservation of vision in an eye the seat of advanced glaucoma, by continuous use of myotics over a period of twelve years. The power of eserine and pilocarpine in chronic glaucoma to preserve the unoperated eye from glaucomatous attacks after iridectomy on its fellow was discussed, and the necessity for maintaining the pupils in a state of almost maximum contraction. He considered the proper dosage and the best manner of administering both eserine and pilocarpine and the choice between them in various types of cases.

Dr. John A. Weeks, New York, thought that better results might be obtained with myotics if their use was persisted in as advised by Dr. Posey, but not the least of the difficulties was the lack of perseverance on the part of the patient. If for any reason the treatment could not be satisfactorily carried out, or if, on subsequent examinations, there was a diminution of the field for form or color, he would urge iridectomy. Dr. Chas. S. Bull, New York, was in full accord with the statement of Dr. Posey that operative procedures were always to be deprecated when other means are equally valuable. He thought iridectomy almost valueless in chronic simple glaucoma unless done early in the progress of the disease. For some years, in the more advanced cases he had followed the line of treatment indicated by Dr. Posey and had been at least satisfied with the results. Dr. Geo. E. de Schweinitz, Philadelphia, thought Dr. Posey would find many if not the majority of surgeons in accord with him in so far as his estimate of the value of myotics was concerned in the treatment of this disease, and also find many surgeons totally averse to iridectomy in the treatment of so-called chronic glaucoma. Personally, he was perfectly satisfied of the great value

of myotics in the treatment of this disease, no matter at what age, and believed they should be continued persistently as long as they did good, but that it was safe to use them only with the patient under control and with frequent tests of the light sense, the field of vision, the color sense, and particularly for the presence of scotomas. Dr. W. H. Wilder, Chicago, did not believe that chronic glaucoma cases were ever benefited by iridectomy, but that many of them were injured by the operation. The keynote of the whole matter was that we should study the changes going on in the vessels and the increased arterial tension; that constitutional treatment was more important than iridectomy. Dr. Peter Callan, New York, did not think that iridectomy did any harm if properly done, and he advocated its use.

FRIDAY, JUNE EIGHTH, MORNING SESSION.

So-called leucosarcoma of the iris. Dr. E. V. L. BROWN, Chicago. The writer considered that Ribbert's theory of the origin of all uveal sarcomas from chromatophores is worthy of most careful further consideration. Second, that the analogy between the round, spindle, and star-formed cells which proliferate in sarcoma, or the spindle and star-formed cells found in the embryonic choroid, is incomplete, because a round-cell first stage has not been proved to exist in the latter. Third, that it is more reasonable to suppose that the "cell reversion" takes place to any one of these forms of sarcoma, analogous to the relations which obtain between embryonal and pathologic conditions in glioma, than it is to suppose that lower cell forms are transformed into higher cell forms. Fourth, that so-called leucosarcoma of the iris offers a more favorable opportunity for the study of the chromatophore theory than does sarcoma of the choroid, because here the normal chromatophore is much less heavily pigmented than in the normal choroid, or than the chromatophore in the iris. Pressure, too, destroys the normal cell. Fifth, the term leucosarcoma should be retained, but used only in reference to the clinical appearance of iris sarcoma.

Dr. F. H. Verhoeff, Boston, thought that the observations of Dr. Brown were valuable in confirming the facts upon which the theory of Ribbert is based, although they still left the theory itself open to doubt. He did not regard as valid the objection to Ribbert's theory made by Dr. Brown, that the origin of chromatophores had not been traced as far back as round cells, for

it was recognized that cells of all kinds when in an undifferentiated stage tended to assume a round form. Dr. H. V. Wuerdemann, Milwaukee, said that for purposes of diagnosis and prognosis we must discriminate between these leucosarcomata and the malignant sarcomata in a clinical way. He had found chromatophores in all the cases of uveal sarcomata he had examined in recent years. Cells containing many chromatophores, or fusiform elements, were more prone to produce themselves, and hence such tumors were more prone to recurrence than those containing cells more like the normal elements of the body, and therefore from the microscopic diagnosis a more favorable prognosis could be offered in the cases of these tumors containing chromatophores.

Dr. E. V. L. Brown, Chicago, in closing the discussion, was in accord with Dr. Verhoeff as to the uncertainty of this theory, but thought the burden of proof was for some one to show that there is a leucosarcoma that does not contain chromatophores.

The differential diagnosis and prognosis of tumors of the uveal tract. Dr. H. V. WUERDEMANN, Chicago. This paper treated the subject from a clinical standpoint, with reference to microscopic diagnosis. Tumors were considered under the headings of cysts, angioma, myoma, sarcoma, metastatic sarcoma, and carcinoma. All malignant tumors were considered as really sarcoma or carcinoma. The writer said that the division of carcinoma into leucosarcoma and melanosarcoma is microscopically incorrect, but necessary from a microscopic, clinical, diagnostic, and prognostic standpoint, as the less pigmented tumors offer a less unfavorable prognosis. In diagnosis stress was laid upon transillumination of the eye. The literature was collated to date and many original observations included.

Dr. Chas. S. Bull, New York, said there was little to criticise and much to commend in Dr. Wuerdemann's presentation. He agreed with Wuerdemann that for purposes of diagnosis and prognosis Schieck's view, that these tumors are all to be classed as melanosarcomata, could not be accepted. When it came to a question of prognosis, Schieck's conclusions were too far reaching. He thought the method of transillumination in examination of tumors of the ciliary body and of the anterior parts of the fundus was of considerable value. He differed with the essayist as to

tubercles of the choroid being accompanied by inflammatory reaction; he had rarely seen any sign of accompanying inflammation. Dr. E. S. Thompson, New York, advocated the use of the Wuerdemann lamp as being more easily managed and remaining cooler than the Sachs lamp. Dr. Edward Shumway, Philadelphia, placed himself with Dr. Bull and Dr. Wuerdemann against the theory of Schieck that all the sarcomata of the choroid are developed from chromatophores. Dr. O. F. Wadsworth, Boston, thought with regard to the prognosis in cases of sarcoma of the choroid that the estimates given by Dr. Wuerdemann were altogether too favorable; in his experience most of the cases he had been able to follow had died.

The treatment of progressive atrophy of the optic nerve, due to acquired syphilis, by subconjunctival and intravaginal injections of sublimate of mercury. Dr. CHAS. S. BULL, New York. Twenty-five cases of simple atrophy of the optic nerve due to acquired syphilis were treated by this method. Cases of tabes and disseminated sclerosis were excluded. All cases had previously undergone a thorough anti-syphilitic treatment by mercury and potassium iodide and vapor baths, and had also been subjected to hypodermic injection of strychnia. Subconjunctival injections, preceded by injection of cocaine, always made far back beyond the equatorial region, were employed. Strength of sublimate solution varied from $\frac{1}{8000}$ to $\frac{1}{2000}$. Ten minims was the minimum amount injected; maximum was 20 minims. Injections were usually made on alternate days, and if no improvement followed the tenth injection, treatment was abandoned. No permanent improvement of the vision in any case; only in three temporary improvement. This method of treatment for these desperate cases of syphilitic atrophy of the optic nerve had added nothing of value to therapeutics.

Dr. S. D. Risley commended the writer's courage in carrying out these experiments clinically, although he had arrived at negative results. He advocated the subconjunctival salt injections in diseases of the anterior segment of the globe, and had seen the entire uveal tract clear up under the action of repeated, prudently made subconjunctival injections, not of solutions of mercury, but of the so-called physiological salt solution. Dr. A. E. Hubbell, Buffalo, had had some experience along this line, though not so systematically persisted in as by Dr. Bull. His results, like those of Dr. Bull's, had been entirely negative.

Paraffin plates as an aid in operations for extensive symblepharon and the restoration of culs-de-sac for prothesis.

Dr. WM. H. WILDER, Chicago. The writer referred to the difficulty of successful treatment of severe cases of symblepharon and the necessity of grafting into the new cul-de-sac some form of epithelial membrane. Mucous membrane was not so available and not so good for this purpose as thin Thiersch grafts from the skin. These must be perfectly coapted and held in place and this could best be accomplished by some form of plate. He described the different methods in use and the author's method, which consisted of the use of metal plates coated with paraffin. The advantages claimed for this method were its adaptability, the certainty with which the graft is applied, and the lack of danger to the cornea from the plate.

Dr. Chas. H. May, New York, had had no experience with the metal plate; though in one case he had tried Hotz's plan of using a lead plate. He had been well satisfied with the porcelain supports. As to the grafts, he believes the Thiersch grafts were generally preferable to the Wolff grafts, though not prepared to say that the former should always be used. He agreed with Dr. Wilder that no sutures were necessary. Dr. C. W. Hawley, Chicago, had seen Dr. Wilder's plates used in two cases with very desirable results. He had been very well satisfied with the Thiersch grafts. Dr. John E. Weeks, New York, referred to the necessity for the flap having attachment to the periosteal tissue in order to maintain the depth of the cul-de-sac; another essential was that the plate should be sufficiently large to carry the graft to the depth of the groove in case sutures were not employed. He thought Dr. Wilder's plate met that indication fully. Dr. S. D. Risley, Philadelphia, said he knew of nothing we attempt in which success depended so much upon technique as in this operation. He had tried many methods and believed this would be a decided improvement. He was very fond of the Thiersch grafts, which he carried to the parts from the razor without putting into any solution. Dr. C. D. Wescott, Chicago, had had the privilege of assisting Dr. Wilder, and added his testimony to the simplicity of the method as compared with others.

The relation of diseases of the nasal accessory sinuses to disease of the eyes. Dr. FRANK A. BRAWLEY, Chicago. The essayist considered that periodical attacks of unilateral headache

are practically always of nasal origin, involving the frontal and ethmoidal sinuses and usually non-suppurative in type. Absorption of the contained oxygen by the lining membrane of the cells brings about a vacuum, congestion and swelling of the membrane follow, producing irritation of the nerve endings, with resulting reflex ocular disturbances. An active congestion occurs in the orbital tissues as a result of a blocking of the branches of the ophthalmic artery which supply the lining membrane of these cells. Application of adrenalin to affected middle turbinal was a specific means of diagnosis of this condition by re-establishing air communication between nose and sinuses, with resulting relief of subjective symptoms. A specific treatment was resection of anterior third of affected middle turbinal, with consequent exposure of the exits from these sinuses and permanent relief from subjective symptoms.

Dr. Nelson M. Black, Milwaukee, agreed with Dr. Brawley that these more obvious and striking forms of interdependent diseases have for a long period been recognized and treated, but it was easily seen that this relation had only been recognized by having the presence of the nasal condition forced upon the observer either by the existence of a profuse discharge, or the patient's calling attention to some existing nasal condition.

REPORT OF MEETINGS OF THE OPHTHALMOLOGICAL SECTION OF THE NEW YORK ACADEMY OF MEDICINE.

By DR. W. H. WOOTTON, SECRETARY.

MONDAY EVENING, OCTOBER 16, 1905. PRESIDENT, DR. WILBUR B. MARPLE, IN THE CHAIR.

Dr. JOHN E. WEEKS presented a case of **epibulbar epithelioma**. The patient, J. B., aged sixty-three years, was first seen in October, 1904, through the kindness of Dr. Henry W. Wandless. The right eyeball was the site of a growth which had begun twelve or thirteen years previously, and had gradually increased in size. It extended from the caruncle over the ocular conjunctiva and on to the cornea, reaching the margin of the pupil in the horizontal meridian, extending to the vertical meridian of the cornea above and below. It presented a mulberry-like appearance, and was elevated two or three millimetres. A piece of growth was examined at the laboratory of the New York Eye and Ear Infirmary, and was found to present all the appearances of epithelioma. The cornea, where not invaded, was clear, and vision with glasses was 20/30.

In March, 1905, the patient was referred to Dr. George S. Dixon, of the New York Eye and Ear Infirmary, for treatment by means of the X-ray. Since that time eighty-four exposures to the X-ray have been made, the average duration of each exposure being seven minutes. The growth resisted the influence of the X-ray until perhaps thirty exposures had been made, when it began to disappear. At the present time there remains only a small, thin islet at the upper margin of the cornea, measuring perhaps 2.5mm in diameter. The patient has experienced no pain as a consequence of the exposures; there has been no burning of the eyelid or of the tissue of the eye.

The fundus of the eye is normal. There is a slight haziness of the outlines of the optic disk above and to the temporal side, but this is well within the physiological range. The vision remains the same.

The tube employed in treating this case was a Gundelach of medium tension, placed at ten inches from the eye of the patient, and so screened that the rays impinged on the eyeball and lids only.

The case illustrates the toleration of the X-ray by the tissues of the eye.

Dr. WILBUR B. MARPLE presented a case which he had shown at the February meeting of the Section, and which had been under treatment by the X-ray, more or less, ever since—in order to show the effect of treatment. Inasmuch as this treatment had been carried out by Dr. George S. Dixon, he had hoped Dr. Dixon would be present and report the case himself; the Doctor, however, was unable to be on hand this evening.

The patient had been under treatment for about four or five months; every day for four months, then every other day, and the séances had lasted about five minutes each time. Dr. Dixon had not made these longer for fear of injuring the eye, although the sight was so poor that possibly the séances could have been lengthened without having any effect on the sight. The treatment was continued until about the end of August, when Dr. Dixon had made the note that the eye was well. At the end of ten days or two weeks, however, there was a slight relapse.

The condition has certainly been very much improved, although there is still a little infiltration below the cornea.

Dr. ARNOLD KNAPP presented a patient, a girl, nine years of age, upon whom he had performed an **exploratory Kroenlein operation** on February 9, 1905, on account of an exophthalmos with optic neuritis, with an obscure etiology of traumatism. The operation revealed a distention of the sheath of the optic nerve with blood (**hæmatoma of the sheath of the optic nerve**). Upon evacuating this the exophthalmos was reduced. After the operation the old condition returned, and at present the eye protrudes more. The vision at present is 20/40; distinct optic neuritis; no contraction of the field; no other symptoms.

The case is presented with a view to eliciting the opinions of the members of the Section as to what had best be done.

Dr. ARNOLD KNAPP also presented a woman, twenty-eight years old, from whose **orbit** an **osteoma** had been successfully removed on August 30, 1905, without implicating the eyeball. The bony tumor was situated behind the eye, causing exophthalmos. It was nearly round in outline, measured 2.5mm in diameter, and was attached by a very small root of perhaps 0.5mm to the upper and anterior portion of the os planum of the ethmoid bone. The attachment was so slight as to make the removal of the tumor very easy. The periosteum was found to be adherent all around the neck of the tumor. The cosmetic result of the operation is excellent; there is no deformity whatever; the diplopia is diminishing; to-day it is present only in the lowest part of the field.

Dr. W. B. MARPLE also presented, for Dr. R. G. REESE, a patient suffering from **arterio-venous aneurism**, recurring after ligation of the carotid artery.

The patient was a man, twenty-one years old, who had pulsating exophthalmos, right eye, for seven years, due to traumatism. Three years ago the common carotid, right side, was ligated with no result. At present the eye protrudes. Veins all over side of head tortuous and dilated. Deep furrows can be felt in cranial bones which the pulsating vessels have chiselled out. A distinct bruit can be heard all over right side of head, and with gentle pressure over the ligated carotid the bruit disappears. Since he presented the case Dr. Rogers has operated and found that the common and external carotid and internal jugular vein were obliterated, and the collateral circulation had been established through the lingual. He tied the internal carotid and lingual a week ago, and the eye had receded very much, no bruit and no unpleasant symptoms whatever.

Dr. LINN EMERSON presented a patient in whom **amblyopia ex anopsia** had improved within thirty days of injury to the better eye.

W. R. C., aged eleven and one-half years, was seen April 4, 1905, with a history of severe headaches while in school. The ophthalmometer showed no astigmatism. Vision was 20/15 in the left eye, and he accepted + 0.5 sp. In the right eye vision was but 20/70, and was not improved by glasses. As no apparent reason for this reduction in vision could be ascertained, a solution of atropin was given with instructions to return after four days for a more careful examination,—at which time

D. V. = 20/50 w + 1.25 s.; S. V. = 20/15 w. + 1.00 s. A most careful examination of the interior of the eye failed to explain the amblyopia. Patient was given D. + .75 s. + .50 s. As no history of squint or of injury could be obtained, the opinion was given to the family that it was a congenital case which would grow neither better nor worse.

On June 23, 1905, while indulging in a premature Fourth of July celebration, he put a fire-cracker in a bottle, which exploded in close proximity to his face. A long splinter of glass (which I did not see) pierced the left upper lid, perforating the globe at the corneo-scleral margin, giving rise to considerable prolapse of the iris. The cornea was also cut in several places by smaller pieces of glass, but none of the other wounds was perforating. Within two hours of the injury the prolapsed iris was excised and a proper dressing applied. The distress of the family was augmented by the fact that the "good" eye was the injured one. The case made satisfactory progress, and on July 17th the vision in the injured eye was 20/100. The patient then stated that his other eye had improved, and I was surprised to find vision 20/20 - 2.

On July 31st it had risen to 20/20 - 1, and on Sept. 8th, D. V. = 20/20 + ; D. S. 20/40 - .

Dr. E. GRUENING, referring to Dr. A. Knapp's case, thought, if an actual recurrence had taken place, the tumor could be reached again by an incision severing the externus without repeating the Kroenlein operation. Sufficient room would be obtained in this way to allow a piece of the sheath to be excised.

Dr. F. N. LEWIS thought that after evacuation of the blood the employment of a tight pressure bandage would be advisable.

Dr. L. HUBBELL, of Buffalo, thought that if the diagnosis of a recurrent hæmatoma were accurate, Dr. Gruening's suggestion was very good; but, in his opinion, drainage might be attempted through a hole in the bone flap. He thought that possibly a cellulitis might be the cause of the return of exophthalmos.

Dr. EDGAR S. THOMSON stated that in two cases in which he had performed Kroenlein's operation for the removal of an orbital tumor, exophthalmos had persisted after the operation, and, in fact, had been as marked as it was before. He thought that this might be due to thickening of the orbital tissues.

Dr. M. L. FOSTER had seen slight exophthalmos persist, but

it had been so slight that it was only noticeable on close inspection.

Dr. J. E. WEEKS had never seen a case of post-operative exophthalmos, and, as far as he knew, the records of other operators had not described it.

Dr. A. KNAPP had never before seen a return of exophthalmos after a Kroenlein, but was loath to make another attempt, and did not think there had been a cellulitis.

Dr. J. E. WEEKS asked if a blood examination had been made.

Dr. A. KNAPP responded that it had not.

Dr. W. B. MARPLE did not think that a Kroenlein operation was apt to be followed by exophthalmos.

There was no discussion of the other cases.

Dr. M. L. FOSTER read a paper entitled **case of chronic inflammatory glaucoma; iridectomy; onset of acute glaucoma three days later; a second iridectomy followed by sympathectomy.**

A woman, forty-eight years old, had originally consulted him on account of presbyopia, and was found to have the characteristic symptoms of chronic glaucoma, which, apparently, was non-inflammatory. The glasses which were prescribed relieved all the subjective symptoms which led the patient to seek relief. There was no change in the glaucomatous condition for six months, no inflammatory symptoms appeared, the vision did not fail, and the fields became no smaller. About the end of that time a small foreign body was removed from the cornea of the right eye, the irritation thus produced persisted, and, six days later, iridectomy was performed on both eyes because of plus tension and ciliary injection of each. Both eyes seemed to do well at first, the left went on to uninterrupted recovery, but three days after the iridectomy an acute attack of glaucoma supervened upon the right.

Heat and eserine were of no avail, so a second iridectomy was performed on the right eye six days after the first. This relieved the pain, but otherwise seemed to have no effect. After this operation eserine increased instead of relieving the pain of the glaucoma. A month later the superior cervical ganglion of the sympathetic on the right side was removed. This operation was followed very slowly by its usual sequelæ. Sixteen hours after the operation there was a slight ptosis, a slight facial paralysis,

and less redness of the eyeball, but the tension was unchanged. Three days later the tension was about the same. Ten days after the operation the tension had fallen somewhat, and in less than three weeks it had become normal. Eight months later the eye had become blind, and was again hard and painful. It was enucleated.

Dr. FOSTER called attention to several peculiarities of the case. It demonstrated that a person suffering from glaucoma may be fitted with glasses without suspicion that any disease exists. The disease remained stationary for six months after it came under observation, and seemed to have been excited into activity by a trivial injury of the cornea. The iridectomy, which was successful in the one eye, was followed by an attack of fulminating glaucoma in the other, which yielded neither to antiphlogistic measures nor to a second iridectomy. The sympathectomy was gradually followed by a retrogression of the tension, instead of the instantaneous fall to be expected, and in several minor respects the effects produced varied from those heretofore reported. This slow fall of the tension, with the other variations from the natural sequelæ of the operation, together with the fact that there was no definite pathological lesion in the excised ganglion, and the further progress of the disease seem to indicate that the glaucoma was not dependent on any pathological condition of the sympathetic nervous system and was unaffected by the removal of the superior cervical ganglion.

In the discussion, Dr. F. N. LEWIS asked if cocaine had been used to extract the foreign body. If so, he thought this might have started the glaucoma.

Dr. FOSTER responded that it had, probably in 2 % solution.

Dr. E. GRUENING doubted that cocaine increased the tension. The internal administration of the fluid extract of jaborandi in large doses did at times great good in the most desperate cases, or pilocarpine used hypodermically.

Dr. MARPLE stated that not infrequently, after an iridectomy for glaucoma, the anterior chamber would reform too rapidly and the tension would increase. The daily opening of the anterior chamber with a spatula was of service in these cases.

Dr. M. FOSTER had used salicylate of soda in these cases to produce diaphoresis.

Dr. E. GRUENING stated that the depressing action of jaborandi on the heart had been very much exaggerated. If given in

hot coffee, the dose could be gradually worked up to forty drops even in old people.

Dr. HUBBELL wished to verify Dr. Gruening's statement in regard to jaborandi. After an iridectomy he had seen an apparent aggravation of the glaucoma from the use of eserine, and had had to suspend its use and substitute pilocarpine.

Dr. EDWARD B. COBURN read a paper entitled **pyæmia, orbital cellulitis, and death, following the use of mesotan**. A woman, aged thirty-one, had complained of severe pains in the back and abdomen for six months. To relieve the pain in the back she was advised to use mesotan, which was rubbed in repeatedly. Whether it was used pure or diluted is unknown. Her condition became worse, pains were general throughout the body, and for a time she could not move the left leg. Four days later she had convulsions, and her right eye began to swell. At different times she was delirious. She was removed to Roosevelt Hospital, where her temperature on admission was $104\frac{1}{2}^{\circ}$, pulse 128, respiration 52, with albumin and casts in the urine. Blood-count showed 35,000 leucocytes. A clinical diagnosis of abscess of the back with general pyæmia was made. The eyelids were swollen, the conjunctiva chemotic and protruding between the lids; the eyeball was pushed forward and was immovable and stony hard. The pupil was dilated and did not respond to light. Ophthalmoscopic examination showed the retinal veins much enlarged.

This complication was diagnosed as metastatic orbital cellulitis. Operation on the back seemed imperative, and was performed at once, local treatment of the eye being temporarily suspended. Exploration of the lumbar region and kidney revealed only superficial foci of pus containing streptococci. The patient's condition grew worse and death occurred the following morning. At the autopsy, multiple small abscesses were found in the liver and kidney and an anatomical diagnosis of pyæmia was made. Mesotan sometimes causes a vesicular eruption. Whether infection occurred through the channels thus opened or whether the mesotan was simply an incident in the case, it is impossible to state.

The Section adjourned by limitation.

MONDAY EVENING, NOVEMBER 20, 1905. PRESIDENT, DR. WILBUR
B. MARPLE, IN THE CHAIR.

Dr. F. N. LEWIS presented a case of **trachoma with pannus treated with jequirity powder.**

The patient, seventeen years old, gave a history of having gotten sore eyes eight years before, for which he was treated with bluestone, hot water, and other applications. Since that time he has been under treatment at various hospitals and dispensaries. All forms of treatment have been employed. At times there has been some improvement, but case always returned to the former bad condition. He was admitted to the Manhattan Eye, Ear, and Throat Hospital on January 24, 1905. Both eyes were affected with pannus to an extreme degree. The lids were thick and swollen. There was much lachrymation and photophobia. The palpebral conjunctivæ showed thick, firm granulations. Vision in each eye was reduced to perception of light. Powdered jequirity was rather freely dusted on the eyeball in the afternoon and again at night. The following morning there was an increase of swelling of lids with muco-purulent discharge. Cold applications were employed with frequent cleansings with boracic acid solution, and atropin in castor oil was instilled.

Two days later the same treatment was followed in the other eye. In the second eye the swelling and discharge were such that for two or three days it seemed as if a bad result would follow. But both eyes improved rapidly. The pannus disappeared, the eyeballs became free from redness, photophobia disappeared, the lids improved, and the time the patient left the hospital, February 13, 1905, there was vision of 20/100 in one eye and 20/200 in the other. Treatment was continued with bluestone, and later with bichloride of mercury solution (1 : 500) rubbed into the palpebral conjunctivæ. Atropin was also used. At the present time the eyes give little trouble, although at times, as recently, after a cold in his head, one eye showed some indication of return of the inflammation. He is still being treated, but states that the eyes have never been as well as at present, and the appearance of the eyes is in every way quite satisfactory when you consider the former condition. The vision now is 20/70 in one eye and 20/50 in the other.

Dr. H. W. WOOTTON presented cases illustrating **recent and**

remote results of advancement of the externi for convergent strabismus.

The first case had been operated upon five years ago by Dr. Wootton's method. There was binocular fixation for all distances and binocular single vision by every test. The patient could overcome a 7-degree prism in abduction, and the power of convergence was normal.

The second case, operated upon by the same method three and one-half years ago, had binocular fixation for all distances; orthophoria for distance; could overcome a 4-degree prism in abduction. He could not practise bar reading.

Two recent cases operated upon by the modification of Dr. Wootton's advancement, devised by Dr. J. J. Thomson, were also shown.

The first was of about eight months' standing. The second of two months'. They possessed binocular fixation; neither had any degree of binocular single vision. Convergence was perfect in both. They were exhibited to show the condition of the conjunctiva at this period after the operation.

Another case was also shown to illustrate the theory that this operation is improper unless a well marked secondary divergent paresis is present. The patient was first seen some five years ago. He then had convergent strabismus of 25 degrees. Full correction under atropin was prescribed. A few months later, as his record shows, the eyes were nearly straight with the glasses. Notwithstanding this, both externi were advanced, with the resulting well-marked divergence which has persisted ever since, and it is only by wearing a markedly under-correction, which gives him symptoms of accommodative asthenopia, that the eyes are apparently straight.

In the discussion which followed, Dr. CHARLES MAY stated that he had been favorably impressed by the results of double advancement done for convergent strabismus. He had performed the operation twelve or fourteen times under local anæsthesia, and, so far, had had no cause for regret. Dr. Wootton's cases showed some fulness over the muscles, but he thought there was not so much in cases operated upon by Worth's method. Worth did not employ the middle suture, which he thought interfered with the blood supply.

Dr. W. B. MARPLE had performed Worth's operation, but had found it difficult to remove the sutures; he had understood

that Worth had modified his method of introducing the sutures.

Dr. F. N. LEWIS thought that one great point in favor of double advancements was that the convergent power was retained in addition to the good cosmetic result produced by the non-sinking of the caruncle.

Dr. ALEXANDER DUANE stated that an advancement increased the power of action of the muscle advanced, but that it also hampered to some extent the action of its opponent, and that this was a fact to be reckoned with. A thorough tenotomy resulted largely in a paresis of the muscle cut, and did not materially increase the action of its opponent. So the two operations were not exactly opposites. In one of Dr. Wootton's cases he thought the action of the interni was limited to a slight degree.

Dr. E. GRUENING stated he would like to see more cases. The six shown, although successful, were hardly sufficient. He thought that possibly we saw only the brilliant results.

Dr. WOOTTON, in closing the discussion, stated that in some cases the operation was not advisable, and in some contra-indicated. For instance, in extreme amblyopia, only a cosmetic effect would be obtained, and as ultimate divergence was practically certain to result from either a tenotomy or an advancement, and as a tenotomy was infinitely the easier operation, it hardly paid to do an advancement.

In cases in which the eyes were straight for distance with correction, probably no divergent paresis existed, and the operation was contra-indicated.

Dr. E. L. MEIERHOF presented a patient illustrating the **value of orthoform as a local anæsthetic.**

The treatment of lime-burn of the cornea and conjunctiva by orthoform.

The man was presented to show the beneficial effect of orthoform in allaying the great suffering induced by burning of the cornea and conjunctiva by lime. This was the fourth case of its kind in which Dr. Meierhof had had the opportunity to test the effect of the drug. The orthoform is dusted into the injured eye and allowed to remain until washed away by the tears. It is best to precede the application of orthoform by a 4 % solution of cocaine, as the first effect of the orthoform in the eye is very irritating ; but in twenty or thirty minutes, when

the cocaine has lost its influence, the orthoform will have asserted itself. Two or three insufflations a day are all that will be necessary for a few days. Orthoform can be made up in an emulsion of 10 to 20 % and applied to the eye in the form of drops. The powder without admixture of any other substance was used in this case.

Dr. CHARLES J. KIPP, of Newark, N. J., read a paper entitled, **euphthalmin conjunctivitis.**

Euphthalmin I have used quite extensively in private practice as well as in the hospitals, for the purpose of dilating the pupil sufficiently to make a satisfactory ophthalmoscopic examination. I have used one or two drops of a 5 % solution for this purpose, usually but once, but in a few patients have repeated the instillation several times in the course of a year, and have never seen unpleasant results follow its use when applied in this manner. Recently I have had, however, a case in which the remedy was applied twice daily, continuing for four weeks, and in this instance a blepharo-conjunctivitis was apparently produced by it. In no other case have I used the euphthalmin continuously for days. The case is as follows : Mr. T. G. A., seventy-five years of age, was seen by me for the first time five years before this visit in 1905. His vision at that time was R — M. 2.5 D. S. = $\frac{5}{30}$ L — M. 2 S. = $\frac{5}{40}$. In both eyes the anterior parts were healthy. The vitreous body was full of floating membranous opacities the optic disks could only be made out with difficulty, but appear normal. I did not see him again until September 30, 1905. On this date I found that he had in both eyes an opacity in the centre of the cornea, which covered the pupillary area. The opacity was round in form and resembled the so-called ribbon-shaped opacity seen in eyes with deep-seated affections more than anything else. His vision was so greatly reduced that he had difficulty in finding his way. The tension of the eye was normal. To enable me to make an ophthalmoscopic examination, I put a drop of a 5 % solution of euphthalmin in each eye, which had the desired effect. I found the vitreous body much clearer and a very large ring of atrophy of the choroid around the disk in both eyes. His vision was very greatly improved with the moderately dilated pupil. It was now R — M. 2.5 D. S. = $\frac{6}{18}$. L — M. 2.5 D. S. = $\frac{6}{18}$. I prescribed for him euphthalmin hydrochlorid in a 4 % solution, and advised him to instil a drop in each eye morning and afternoon. Five weeks later he returned to me.

In both eyes, both lids were very œdematous, and in parts covered with dried crusts. There was a much dried secretion among the cilia. The conjunctiva of the upper and lower lid of both eyes was swollen and covered with numerous enlarged follicles. The cornea was not affected. I learned from the patient that he had used the instillation for about four weeks before any unpleasant symptoms showed themselves; at that time swelling of the lids began, then eyes became somewhat painful, and an abundant discharge of muco-purulent secretion followed. He attributed the new condition to the effects of the euphthalmin, and stopped the instillations. In the course of a week the inflammation had greatly subsided, and, as he desired to see again as well as he had while using the euphthalmin, concluded to resort to it again, but before doing so he prepared for himself a 2 % solution by mixing equal quantities of boiled water and of the 4 % solution in another bottle. He again instilled a drop of this new solution twice daily for a few days, but had to give this up as the swelling of the lids and the amount of secretion from the conjunctival sac had become much greater than it was ten days before. Fearing that atropin had been substituted for the euphthalmin prescribed by me, I had him bring to me the bottle containing the solution he had used. The label showed me that it had been prepared by a reputable apothecary, who, by the by, turned out to be a near relative of the patient. I visited the apothecary, saw my prescription (it called for euphthalmin hydrochlorid gr. v.; aquæ distill.), and also saw the vial from which the euphthalmin had been taken. The label on the vial was as follows: "1 gm. euphthalmin hydrochlorate, U. S. A. Patent No. 663,754, dated December 11, 1900." I also had a bacteriological examination made of the solution used by my patient, and Dr. R. N. Camolly, who kindly made the examination, reported as follows:

"Examination of the eye solution received from you shows that it contained a common mould, mucor, and a small bacillus, in shape and size resembling the colon bacillus, but it did not produce fermentation in glucose bouillon, and, consequently, is not the colon bacillus. This bacillus does not resemble any of the pathogenic germs with which I am familiar, and so far I have not been able to identify it. The above were the only micro-organisms found."

The facts here stated leave but little room for doubt that

the conjunctivitis was caused by the euphthalmin and not by impurities contained in the solution.

It is well known that solutions of atropin will, after prolonged application to the conjunctiva, in some persons, produce a conjunctivitis, with or without so-called granulations, and a dermatitis of the lids, and I have seen the same follow the use of solutions of duboisin, eserine, and cocaine. (I have not yet seen a conjunctivitis follow the very prolonged use of strong solutions of pilocarpin hydrochlor.) Some writers hold that a conjunctival affection is never seen if the sterile solutions are used, but this is an error, as I have seen the same form of conjunctivitis and dermatitis develop in patients in hospitals in which the solutions were made fresh daily. Lewin and Guillery, in their recent exhaustive work, *Die Wirkungen von Arzneimitteln und Giften auf das Auge*, vol. i., page 198, after reviewing the whole literature on this subject, express their opinion that the so-called atropin conjunctivitis is simply a drug eruption, the form of which is determined by locality, and that its development is solely dependent on an individual predisposition; they think that this is conclusively proved by the fact that in many persons thus stigmatized similar changes in the conjunctiva are produced by the application of other tropinæ. I have no doubt that the above applies also to euphthalmin conjunctivitis. The short duration of the mydriasis produced by euphthalmin, together with the high price of that drug in this country, has probably prevented its extensive and protracted use in cases where permanent dilatation of the pupil is desired, and this may be the reason why a conjunctivitis from its use has not been more frequently observed.

The only mention of conjunctival affection resulting from the instillation of euphthalmin that I have been able to find in literature is by Dr. H. Knapp, who, in the discussion following the reading of a paper by Dr. H. M. Starkey on the use of a mydriatic after the age of forty-five, stated that he had seen a case of atropin granulation develop after the daily use for six months of a solution of euphthalmin. No particulars are given. He stated that this case suggested to him the idea that euphthalmin was in all respects a weak atropin, but on using it in a patient with well-marked idiosyncrasy against atropin it failed to produce erythema or any other irritation.

In conclusion I may state that the conjunctivitis and dermatitis in my case disappeared entirely in the course of three weeks

after discontinuance of the eupthalmin, under the use of weak solutions of zinc sulphate and zinc oxide ointment. During the last month my patient has been using daily a 1:2000 solution of scopolamin, which had not as yet produced conjunctivitis.

Dr. J. A. LIPPINCOTT, of Pittsburg, Pa., read a paper entitled, **Intraocular irrigation: its advantages and technique.**

History.—Saint-Yves in 1722 irrigated the anterior chamber in cases of hypopyon. Fifty years later Guerin Sommer and others removed cortical remains by this method. During the nineteenth century the procedure was practically in abeyance until it was revived in 1884 by McKeown and Inouye, who were followed by Vacher, Panas, Wicherkiewicz, etc. Early American literature on the subject scanty, consisting of one paper by Williams, of Boston, and several by the writer. Recently irrigation has been more freely discussed and its adherents have become pretty numerous.

Objects and Advantages.—In hypopyon, lavage is sometimes useful in disclosing the presence of a foreign body in the anterior chamber or posterior chamber, thus revealing the source of infection. Even in the absence of foreign substances, irrigation is of service in many cases, and the writer has never seen bad results from it.

Intraocular irrigation is, however, chiefly employed to secure a more perfect technique in the extraction of cataract. Its advantages are such as might be expected from a prompt and usually thorough removal from the interior of the eye and the lips of the wound of cortical matter, blood, air-bubbles, and shreds of capsule by absolutely gentle means. The immediate advantages are obvious—the blackness of the pupil, the avoidance of injury to the wound edges by stroking the cornea, the restoration of the corneal dome in cases of inversion from lack of tone, the smooth replacement of an iris that tends to prolapse, etc. The remote advantages are rapid union from perfect cleansing of the lips of the wound, diminished tendency to secondary cataract and also to post-operative inflammations. Irrigation is contraindicated in cases of actual or threatened escape of vitreous; and it is not required when the lens is intact on emerging. It is especially useful in traumatic and immature cataract, in partial lenticular opacities associated with choroidal disease, and in high myopia amenable to operation.

Solutions Employed.—Various fluids have been injected.

Panas, aiming at antiseptis, used biniodide of mercury. De Wecker, for its effect on the iris, injected salicylate of eserine. Neither of these authors approved of lavage as a means of mechanically cleansing the eye. The latter idea was advocated by McKeown, who employed the physiological salt solution, and whose views are now generally adopted. Lagrange, seeking a more perfect approximation to the aqueous humor, adds minute quantities of sulphate of potash and chloride of calcium.

The instruments used for intraocular irrigation are of three types—1st, piston, 2d, rubber-ball, and 3d, gravity syringes. Piston and rubber-ball syringes present difficulties as regards asepsis on account of the back current set up in refilling. Piston syringes are apt to be out of order when needed. The rubber-ball syringe may throw bubbles of air into the eye. In neither of these forms can the force of the current be accurately estimated. Both forms are difficult to manipulate with the precision desirable in all operations on the eye. Of the two, the rubber-ball syringe is, on the whole, the less objectionable. The Williams syringe, which is really in a class by itself, the fluid being propelled by blowing into the reservoir, is open to objection on the score of asepsis and as to the estimating the force of the current. Finally, a properly constructed gravity syringe fulfils all the conditions demanded. The penholder handle, which is the distinguishing feature of the writer's irrigator, in his opinion, utilizes all the dexterity of the most skilful surgeon, and minimizes, instead of aggravating, the deficiencies of those less gifted. In using this instrument the reservoir, containing the physiological salt solution at a temperature of several degrees above that of the blood, is held from eight to ten inches higher than the patient's face. After expulsion of the nucleus, the fluid is allowed to flow until it is at blood heat on emerging. Controlling the current by means of the forefinger resting on the exposed portion of the rubber tube, the operator introduces the tip, and slowly moves it from one end of the incision to the other. It is sometimes necessary to push the tip farther, so as to reach behind the iris, and to bring it into contact with obstinately adhering masses of cortical, thus aiding the dislodging force of the stream.

In the discussion which followed, Dr. H. KNAPP stated that he had always employed syringes with an asbestos packing, and had

seen no infection. His own syringe was simple, but he thought good. It resembled a small Anel's syringe, and he thought it sufficient.

Dr. S. B. ST. JOHN, of Hartford, Conn., had used Dr. Lippincott's syringe; he did not think the method dangerous, and always employed it when he considered it necessary. He used a physiological salt solution, and had never seen any irritation that could be ascribed to it. He had had some cases of striped keratitis, but they had all cleared up rapidly. He frequently introduced the nozzle behind the iris when suspicious that fragments might be there. He did not use Dr. Lippincott's handle, but merely the tip attached to the tube, and controlled the flow by the thumb and finger. If the pressure in the anterior chamber became too great the tip should be raised, thus opening the wound and releasing the pressure. The toilet of the wound was most thorough when this method was used, and he thought that it was absolutely necessary when sticky debris remained, and when the operator thought that further stroking of the cornea would be dangerous. The greater part of the soft lens matter he removed by stroking, and afterward employed irrigation. He had never employed the method in cases of hypopyon, but intended to do so.

Dr. P. A. CALLAN thought the method very advantageous, particularly in cases of soft and traumatic cataract, and also for removing remains in ordinary senile cataract, but the best results were obtained in the first two. He used a rubber-ball syringe with a flattened glass tip. Air bubbles did go in, but apparently did no harm. His tip produced a rotary stream, and he thought this simple apparatus better than the complicated gravity device.

Dr. T. R. POOLEY had only employed irrigation in cases of extensive loss of vitreous, and in these cases he had injected the normal salt solution into the anterior chamber with the idea of restoring the tension. In normal cataract extraction he did not use it; he thought it rather meddlesome and unnecessary. If the extraction had been as thorough as possible, there was less danger from small fragments remaining than there was from introducing another instrument into the wound, which enhanced the chance of infection. He thought that the method would not stand comparison as a matter of routine. When the lens contained a foreign body the practice was to be condemned.

Dr. J. H. CLAIBORNE had never had any satisfaction from irrigation. He thought Dr. Lippincott's instrument was probably

the best for the purpose, although he did not like the handle. In a case which had been irrigated, he had seen infection take place on the fourth day, and a case in which irrigation had been performed with but slight pressure with a pipette had resulted in extensive iridodialysis, and this was a possible danger in lavage of the eye.

Dr. E. GRUENING objected to the irrigation as a routine method. When used, he thought that the simple bulb syringe fulfilled all indications. In a mature or hypermature cataract, the method should not be required. With the long peripheral or "T"-shaped opening in the capsule, the soft lens matter could easily be extracted, and lavage was not necessary. It must, of course, be admitted that in sticky cataracts the method was indicated, and Dr. Lippincott's apparatus fulfilled every indication. Still he thought the simpler bulb syringe better.

Meeting adjourned.

MONDAY EVENING, DECEMBER 18, 1905. PRESIDENT, DR. W. B. MARPLE, IN THE CHAIR.

Dr. DAVID WEBSTER presented a case of **astereognosis** in which eye symptoms were present.

Dr. Webster's report of the condition of the eyes was as follows: The patient, Mr. Jacob C. Gough, came under my observation on the 29th of August, 1905. He gave a history of gradual loss of eyesight, beginning about two and a half years previously. He could go about alone up to about a year ago. For the last year he has seen just about as he sees now. The usual tests show that he has little more than perception of light. If a hand is held up before his eyes without throwing a shadow upon them he sees that something is there, but cannot tell what it is. The same is true of any other object held up before his eyes. He cannot count fingers at any distance or in any position, but he makes his way about the ward and never runs against anything. If you stand in his way he carefully avoids you and goes around you. It seems fair to suppose, then, that while he actually sees objects he is unable to distinguish their form, just as with his hands he feels objects but fails to recognize them, having lost the sense of form.

In other words, he seems to have visual astereognosis, as well as tactile astereognosis. The ophthalmoscopical appearances show

no reason for his loss of vision, the media being transparent and the optic disk and fundus oculi being normal. As to the etiology, he denied to me the excessive use of alcohol and tobacco, and declared that he never had venereal disease. I failed to discover any cause for the disease, unless it might be attributed to financial worry and anxiety. He had been worth two or three hundred thousand dollars and had lost it all, including his wife's fortune, not long before the impairment of vision set in. He is fifty-five years old, and is married to his second wife. He has several children by his first wife, all of whom are healthy adults. His pupils are of medium size and respond actively to light. There is no history of a fall or blow on the head.

The patient took 100 minims of fluid extract of jaborandi every night for two months. No smaller dose would make him sweat. This treatment did not seem to do him any good, and for the last month he has been on iodide of potassium, in increasing doses, with some apparent benefit.

Dr. J. F. TERRIBERRY, in describing the nervous symptoms present, stated that the patient gave a specific history, and that for twelve years he had used alcohol in excess; he was not a steady drinker but drank hard at certain times. No history of rheumatism or malaria. No history of nervous diseases in the family. The neurological side of the case commenced about one year ago, when he began to use his hands awkwardly. Has been free from irritative or compressive brain symptoms. No symptoms pointing to neoplasm. Alimentary tract in good condition. Mental reflexes perfect, possibly a trifle slow. Muscular reflexes present but somewhat subnormal at night.

At the last examination the left patellar reflex was exaggerated. Ankle-clonus reduced. Muscular irritability exaggerated. Chin jerk obtained. In raising hands above the head, the right hand would always be raised higher. Tactile sensibility slow. When the patient was touched upon the arm he could not place his finger where he was touched. Contact was perfectly received, but slowly recorded. When one moved his right hand the patient could only guess which hand had been moved. He had a tendency to resisting passive movements, especially on the right side. In fact, he executed no movement correctly. Muscular sense was practically gone, also, in the lower extremities, particularly below the knee. The typical symptoms of the disease (which is an inability to recognize the character of objects by touch) were

well marked. Imperfect sense of location in the face, particularly in the lower part. Patient could always distinguish heat from cold. The spacing sense was lost. Taste, smell, and hearing normal.

The dynamometer gave 60 with the right and 70 with the left hand. The case had begun with blindness, as Dr. Webster stated, the astereognosis coming on two years later. The lesion was apparently progressive.

In the discussion which followed, Dr. LEZYNSKY stated that the interesting feature of the case was the astereognosis. As to the condition of the eyes, the lesion must be back of the corpora quadrigemina, probably in the cortex. Blindness was not an essential feature of astereognosis.

Dr. P. A. CALLAN presented a case of **infantile glaucoma**. Mary Egan, sixteen years, United States. As a child parents noted that she was near-sighted. When eight years of age, wore glasses for myopia. Two and one-half months ago came to New York Eye and Ear Infirmary. O. D. Blind. O. S. — 10.00, 20/20. Ophthalmoscope showed marked cupping of both nerve heads. Left field very much contracted; green wanting. Two months ago made an iridectomy well back in sclera. Vitreous presented. On second day after operation saw large detachment of retina with choroidal hemorrhage under the raised retina. Hemorrhages around optic nerve in retina, small and striated. At the end of six weeks after operation, retina replaced. No hemorrhage. Case shown to illustrate the advantage of small scleral opening *versus* large cut at limbus.

With latter, enucleation would have been necessary. It was not deemed wise to operate on O. S.

Dr. W. P. MARPLE presented a **modification of Dr. Dennett's electric ophthalmoscope**.

In doing this he stated that he had been unable to use Dr. Dennett's ophthalmoscope satisfactorily, for the reason that the instrument seemed not to illuminate the lower half of the eye, as it should in the direct image. After various experiments, Dr. Marple found that the reason for this was that the mirror was entirely below the line of vision in using the instrument. He tried first a complete mirror, with a central round aperture, as in the ordinary reflecting ophthalmoscope, but found there was so much light reflected around this aperture from the electric lamp, that he could not use it.

He then used a mirror shaped something like the letter "U," that is, one in which all above the aperture had been removed. With this instrument he found that he could illuminate the eye very much more satisfactorily—in fact, as much so, if not better, than with the ordinary reflecting ophthalmoscope.

He had also introduced into the instrument another modification, the suggestion for which he was also indebted to Dr. Dennett's instrument. In the latter instrument the lamp could be shifted, and used in two positions, but the shifting had to be done when the instrument was not in use. By carrying a little rod down, connected with the lamp, at the end of which was a small roughened ball, Dr. Marple succeeded in making the movement of the mirror subject to his control while using the instrument in front of the patient's face. This he had found a very decided advantage. While examining the patient this little ball referred to above was held between the thumb and index finger of the hand holding the instrument, and the lamp could thus be shifted up and down, until the examiner got just the position which gave him the best form of illumination. The instrument will be still further improved by having a lamp, the filament of which, instead of being linear, will be round. This, Mr. Meyrowitz is having made.

The instrument as thus modified or improved is an exceedingly useful one, and Dr. Marple said that he used it almost exclusively now, instead of the ordinary reflecting instrument, so that, instead of being an ophthalmoscope which one might use when one could not use any other, it was an instrument which had many advantages for all purposes, where an ophthalmoscope is used.

He was greatly indebted to Mr. E. B. Meyrowitz (by whom the instrument is made) for many courtesies in perfecting it. It can be attached to any form of instrument.

Dr. E. S. THOMSON presented a case of **conjunctivitis, following traumatism, and accompanied by swelling of the lymphatic glands of the neck.** The history was as follows :

J. L., aged twelve years, about a month ago was shooting a small 22-calibre rifle when the breech blew open, and he was wounded on the lower ocular conjunctiva of the left eye. He was treated, but did not improve, and at the end of a week the lymphatic glands in front and below the left ear began to swell. On his admission to the hospital, there was a thick roll of swollen conjunctiva extending up from beneath the lower lid, but, strange

to say, no swelling of the conjunctiva above the cornea. The swollen part was covered with "marbled" markings of subconjunctival purulent invasion. The glands were markedly swollen and tender, and the temperature ran up to 100°. The blood count gave no information of value. Urinalysis was negative. The conjunctiva was opened, and a culture taken which proved to be purely staphylococcus pyogenes albus. The interesting feature of the case is the limitation of the conjunctival process with the severe lymphatic involvement.

Dr. H. KNAPP presented a **specimen of the anterior capsule of a lens which he had extracted for cataract caused by particles of granite in the lens capsule.**

Man, a stone-cutter, who had had a cataract in the left eye, caused by fine granite particles in his lens. Before the operation four white spots were seen in or just behind the anterior capsule. The lower part of the iris was tremulous. A lower section of the cornea was made through the limbus, and the lens was removed by seesaw pressure with a spoon above and a wire loop below. The cataract escaped with the capsule, without loss of vitreous. The iris fell back in its place, and the healing and results were ideal. Vision good. Dr. Knapp said he would publish the case in detail.

Dr. E. L. OATMAN exhibited **lantern slides illustrating the method of epithelial cyst formation in the iris.**

The paper is published in full in these ARCHIVES, vol. xxxv. No. 4, pp. 309-317.

Dr. OATMAN presented a case of **cataract extraction, followed by eversion of flap and epithelial invasion of anterior chamber.**

Patient, male, aged sixty-four. Mature cataract in O. D. May 30, 1905, the lens was satisfactorily removed by the combined operation. An old trachoma had resulted in such shrinking of the conjunctiva that the fornix would not retain a speculum during operation. Forty-eight hours later, when the dressings were first removed, the corneal flap was found entirely everted, completely covering the lower half of the cornea. It was white, and appeared oedematous. The upper half of the corneal space was occupied by the bulging vitreous, none of which, however escaped. The flap was replaced by a probe manipulated beneath the closed lid. Fomentations were employed. The flap became highly vascularized, and united without inflammatory

complications. Oatman attributed the eversion in this case to atrophy and shortening of the conjunctiva in the lower fornix, whereby downward traction was exerted upon a rather large flap. These conditions enabled a restless, blinking patient to displace the flap sufficiently for the upper lid to catch and evert it. Nov. 7, 1905, the patient returned to the hospital suffering from glaucoma in the aphakic eye. It was surmised that during the time the flap was everted corneal epithelium spread into the anterior chamber, where it continued to proliferate until glaucoma was produced. A broad, downward iridectomy was made.

The section of iris removed was examined microscopically. On its peripheral, anterior surface was a narrow zone covered with superimposed layers of epithelial cells closely resembling the stratified epithelium of the cornea.

Dr. J. H. CLAIBORNE read a paper entitled **a case of conjugate lateral deviation to the left**. The following is an abstract. The patient was thirty-seven years of age, and contracted syphilis five years previously. Had apparently recovered from all signs of it under treatment, but on October 25, 1905, he noticed something peculiar about the eyes. He said he did not see double, but the eyes seemed to him to have a "scum over them." He noticed that his left hand, forearm, and leg seemed numb. These symptoms rapidly passed away. On being questioned further concerning double vision, he said he saw singly, except occasionally.

Status, October 25, 1905.—The eye seemed to stare, but there was no lagging of the lids in downward movements. Both eyes were turned distinctly to the left. At times this was more marked than at others; the right eye looked farther in than the left eye looked out. Convergent power seemed normal. Could not be made to see double in any part of the field. Pupillary reflexes, fundi, fields of vision, and visual acuteness of each eye normal. Tactile sensibility normal. Grip of left hand slightly weak. Romberg's symptom absent, and there was no difficulty in orientation, although his walk suggested a slight ataxia. Left patellar reflex slightly increased; right, normal. He was put upon increasing doses of iodide of potash, but could take no more than fifty grains three times a day.

December 13, 1905.—The eyes seemed straighter, but when the left eye was moved to the median line the right eye seemed still to incline slightly inward. Fields better, but unable as yet

to carry his eyes beyond the median line to the right. Fingers of left hand seemed somewhat stiff and clumsy in his work.

It was quite obvious from the above facts that this was a case of conjugate lateral paralysis, the lateral movements to the right being paralyzed, and what was quite marked and distinct was that the paralysis of the external rectus of the right eye was more pronounced than the paralysis of the internal rectus of the left eye, which was entirely consistent with the recognized view that the centre of the right sixth nerve was the commanding one in lateral associated movements to the right.

These paralyzes necessitated the existence of cross fibres passing from the centre for the external rectus of one eye to the centre for the internal rectus of the other. That it was not a true paralysis of the internal rectus muscle was clear from the fact that convergence was practically normal. Further, none of the fibres for true convergence was affected, but only those from the associated movements to the right. The situation of the cortical movement centre for associated lateral movements had not been definitely determined. It was of interest, he said, to study the probable position of the lesion in this case; the deviation was to the left, and it was a paralytic deviation.

It could not, therefore, be due to an irritative right cortical lesion. It might conceivably be a destructive lesion of the left cortex, for such a lesion would produce deviation to the left. It should be remembered, however, that there was a transient hemianæsthesia and hemiplegia that necessitated the existence of a lesion on the right side of the brain, and, since the deviation in this case was paralytic, it obviously could not be due to a destructive lesion of the right cortex.

We were, however, forced to the inevitable conclusion that the lesion was a destructive one, and that it was situated at the nucleus of the right sixth nerve. As to prognosis, Dr. Claiborne saw no reason why the case should not completely recover, but the improvement so far had been slight. It was unfortunate that the patient was unable to take more than fifty grains of iodide of potash three times a day.

In summing up, the following were the salient features of this case :

1. Conjugate lateral paralysis, with a deviation to the left.
2. Fugacious left hemianæsthesia and hemiplegia.

3. The location by exclusion of the situation of the lesion in the nucleus of the right sixth nerve.
4. Absence of hemianopsia.
5. The obvious predominance of the paralysis of the external rectus as opposed to that of the internal rectus.
6. Retention of normal convergence.

In the discussion of Dr. Claiborne's paper, Dr. LESZYNSKY agreed with Dr. Claiborne in the localization of the lesion, and thought Dr. Claiborne's reason therefor convincing. He would prefer to combine the injection of bichloride of mercury with the internal administration of iodide of potash.

Dr. TERRIBERRY thought that, while the patient would probably recover from his eye symptoms, the ultimate prognosis in regard to his becoming a strong man was exceedingly dubious.

Dr. H. KNAPP read a paper entitled, **on the etiology of lamellar (zonular) cataract.**

Published in the ARCHIVES of March-May, 1906.

On motion the meeting adjourned.

MONDAY, APRIL 16, 1906. PRESIDENT, DR. WILBUR B. MARPLE,
IN THE CHAIR.

Dr. ALEXANDER DUANE presented a case of **excessive diffuse blepharoadenitis** in an otherwise healthy girl of fourteen. The condition had started fifteen months before as a series of styes culminating in a swelling which rapidly involved the whole lid. When the patient first came under observation about a month ago, the lid was enormously swollen and thickened, especially along the ciliary border, where the inflammatory exudate encased the lower edge of the tarsus. The tarsus itself, however, was evidently not affected and the palpebral conjunctiva was normal. The lower border of the lid which hung down so as to cover the eye almost completely was convex, reddened, and covered with crusts concealing several points of suppuration. Smears from these showed staphylococci only. Lid could not then be everted. Never painful nor tender. Cervical glands moderately, and pre-auricular gland markedly swollen. Hot applications and ichthyol ointment were used at home, and at each visit to the clinic all the crusts were removed and lashes epilated and a three per cent. yellow oxide ointment applied with con-

siderable friction. Under this treatment the swelling had gone down greatly, so that the lid could not be everted.

Dr. ALEXANDER DUANE also presented a **case of detachment of the retina with massive underlying exudate.**

The patient, a boy of fifteen, had discovered at the age of six that he could scarcely see anything with the right eye. Other eye normal. Had still perception of light, but recently vision had gradually failed till now it is absolutely nil. Was told one or two years ago at the Eye and Ear Infirmary that he had detachment of the retina. No history of any disease except measles, and careful physical examination shows that, apart from a few enlarged glands in the neck, there is no evidence of tuberculosis or any other serious disease. In the right eye, the pupillary vessels are engorged and tortuous. Below the disk and to the temporal side of it, is a rounded, more or less globular fixed detachment, extending 3 *mm* into the vitreous. Beneath this are masses of white exudate, which apparently contain new-formed vessels. (Appearances here strongly simulate those of neoplasm.) Near this detachment are one or two punctate hemorrhages. Near the disk are a few guttate, silvery splashes of exudate, like those of an albuminuric retinitis. These lie in the retina which here presents only a shadow detachment. Far below the disk is a large wavy detachment of the ordinary form. The diagnosis in this case seemed obscure. The conditions that naturally suggested themselves, viz., a neoplasm, a giant tubercle, or even a very extensive Bright's retinitis, seemed negated by the long duration of the eye symptoms and the absence of any evidences, subjective or objective, of disease.

Dr. ARNOLD KNAPP presented a patient with **traumatic irid-deremia, broad adhesions of lens capsule to cornea, and glaucoma.**

The injury occurred in August, 1904, then resulted in a transverse scar of the cornea to which the lens capsule was adherent; the lens was absorbed. Vision $\frac{2}{30}$, F. n. On account of the glaucoma and beginning enlargement of the eye, the anterior adhesion of lens capsule had been twice divided with capsule scissors, but owing to the broad attachment the wounds in the capsule have always reunited and the glaucoma recurred. Dr. Knapp requested the opinion of the members present on what form of operation should now be done.

Dr. W. E. LAMBERT presented two cases : one of **epithelioma**

of the lid ; The other, **a plastic operation for restoration of the cul-de-sac.**

In the discussion which followed Dr. SCHAPRINGER suggested posterior sclerotomy in Dr. Knapp's case.

Dr. W. B. MARPLE presented **Leber's apparatus for transillumination of the eye.**

Having had a case of intraocular sarcoma recently, which offered some difficulties in diagnosis, he had ever since been especially interested in everything which would make the diagnosis of these intraocular growths surer. He had used the Sachs lamp, and considers the smaller Leber's instrument almost as efficient Mr. Swanzey had reported in the *Ophthalmic Review* for February, 1905, several cases in which he had made the positive diagnosis, in cases of detachment of the retina, of a neoplasm, and the resort to the aid of this instrument should always be made in cases of suspected intraocular growth. Unfortunately, it is only applicable in case the growth is in front of the equator, as it is difficult to transilluminate when it is farther back.

Dr. H. GIFFORD, of Omaha, Nebraska, read a paper entitled **a new eye-symptom in Graves's disease.**

The symptom referred to is a marked difficulty experienced in attempting to evert the upper lids of some patients with Graves's disease. This is especially marked in the earliest stage of the disease, and disappears later on. It does not depend upon the nervousness of the patients, for it is apparent when they are perfectly docile ; nor upon the exophthalmos, for it may be absent with marked exophthalmos, or present when the latter is hardly noticeable. It probably depends upon condition of hyperexcitability of the unstriated lid-levator of Mueller; the cause of this, as of the excessive lachrymation which sometimes accompanies it, probably being an abnormal excitation of part of the sympathetic. This symptom may occur without the co-existence of Dalrymple's sign, or may be absent when Dalrymple's sign is well-marked. Its chief importance depends upon the aid which it gives in the diagnosis of incipient or doubtful cases.

In the discussion of Dr. Gifford's paper, Dr. C. S. Bull stated that Dr. Gifford had been undoubtedly the first to notice this symptom. He had observed it three times in the last year, and considered it of great service in the diagnosis of slight and unilateral cases. He agreed with Dr. Gifford's explanation, and was satisfied that it was a symptom of the disease.

Dr. SCHAPRINGER stated that the nervous fibre running to Mueller's muscle had been accused before of being the cause of enophthalmos following traumatism. He had pointed out that the theory of enophthalmos after traumatism being due to hemorrhage into the orbit followed by cicatricial contraction of the organized exudate could not be true, for the motility of the eye might be unaffected in these cases.

Enophthalmos occurred after division or injury of the sympathetic nerve in the neck, with myosis, but in the orbit somewhere the fibres producing enophthalmos and those causing miosis separated. The enophthalmos following traumatism he had proven to be due to injury of the branch supplying Mueller's muscle.

Dr. GIFFORD had apparently discovered that irritation of this fibre would produce another symptom.

Dr. WOLFF thought the difficulty in everting the lid might be due to Dr. Gifford's explanation, but when cocaine was instilled which caused spasm of Mueller's muscle, was the lid thereby made more difficult to evert?

Dr. SCHAPRINGER stated that cocaine affected only the palpebral, not the orbital, portion of the muscle.

Dr. GIFFORD had never noticed that the lids were more difficult to evert after cocaine had been instilled, but he had referred entirely to the levator fibres in the orbital part of Mueller's muscle. The orbital portion caused exophthalmos in the lower animals, but was so poorly developed in man that it was perhaps doubtful whether its paralysis could produce enophthalmos.

Dr. H. MANNING FISH read a paper entitled, **on the frequency of blindness due to an affection of the accessory sinuses.**

The sudden appearance of an excruciating supraorbital neuralgia in a certain case of iridocyclitis (entirely free from pain for weeks), which could not be accounted for by any change in the inflammatory condition in the eye, led to the conclusion that a frontal sinusitis had caused not only the pain, but the iridocyclitis as well; the latter idea suggested by the frequency with which an accessory sinus involvement had been found by Dr. Fish to be the cause of a stasis in the ciliary body, as shown conclusively by the fact that on drainage of the affected cavity the accommodation range had been restored to normal. The hypothesis was then evolved that accessory sinus disease, in place of being an

exceedingly rare cause, was a very frequent cause of "idiopathic" ocular diseases that arise from a disturbance in the circulation, and it was determined to treat the cavities in succeeding cases, even though the external or intranasal evidences of sinusitis were entirely wanting. The results obtained surpassed all expectation. With but few exceptions (those who did not undergo treatment as recommended, or in the old cases showing no present intranasal pathological changes), a sinusitis was found to be the cause of some twenty different lesions: an affection of the extra-ocular muscles, peri- and retro-ocular œdema with protrusion, conjunctivitis, chemosis, herpes corneæ, superficial and deep abscess of the cornea, interstitial keratitis, hypopyon, enlarged and sluggish pupil, iritis, cyclitis, choroiditis, subretinal exudate, hemorrhagic neuroretinitis, intra- and retro-ocular optic neuritis, vitreous opacities, and glaucoma, all of which lesions were found in the literature, but always as isolated or very rare cases of the various reporters. The generally accepted theory that the ocular lesions are the result of a propagation by extension is questioned on the ground that it fails to account for the cases showing no involvement of the adjacent tissues. These lesions are accounted for by Dr. Fish's theory, that a pent-up secretion in the sinuses causes a periorbital circulatory disturbance through irritation of the sympathetic; a modification of Ziem's theory of a passive orbital hyperæmia, due to under-oxygenization of the blood from a nasal stenosis.

The claim that sinusitis is the most frequent cause of "idiopathic" or obscure ocular disease is supported by the evidence of every examination made on the cadaver as to the condition of the accessory sinuses—over 40 per cent. showed an increase of one or more of the cavities at the autopsy; by the report of Senn, the only man who examined the nostrils in every case of uveitis or iridocyclitis, who found a visible intranasal pathological condition in fourteen out of twenty-one cases; also by the report of Mendel, who found four out of seven successive cases of an involvement of the optic nerve to be due to accessory sinus diseases—the only man who looked for sinusitis in every case of optic neuritis. Of twelve successive personal cases of an affection of the optic nerve, eight were traced to sinusitis. Investigation as to the pathogenesis of corneal ulcer has hitherto been limited to a determining of the route of invasion of the guilty micro-organism, by the fingers or via the lachrymal apparatus

when a purulent secretion was present in the nostril; but the micro-organisms usually found in corneal ulcer are harmless under normal conditions; some circulatory disturbance is requisite to render the cornea subject to infection. In fevers and infectious diseases: typhoid, pneumonia, influenza, measles, erysipelas, scarlatina, typhus, cerebro-spinal meningitis, etc., the accessory sinuses are especially prone to be primarily affected; the ocular lesions following these various diseases, especially those appearing during convalescence, are similar to those found by Dr. Fish to be due to sinusitis. This theory affords the best explanation of their pathogenesis. The diagnosis of optic neuritis, due to anæmia or chlorosis, is arrived at by exclusion, without a thought as to sinusitis, which is accountable for more reported cases of optic neuritis than those due to anæmia or chlorosis.

Glaucoma, considered by various authorities to be due to a disturbed circulation or an irritation of the cervical sympathetic, can result from an irritation of the sympathetic, due to sinusitis. The reporter holds accessory sinus disease to be a very frequent cause of the various ocular diseases, hence of blindness.

Dr. GIFFORD felt quite certain that more attention should be paid to the accessory sinuses. Many cases of headache were not due to the little astigmatism which was present, but could be cured by treatment of the nose.

Dr. ALEXANDER DUANE stated that in cases of pronounced asthenopia, and in headache of the migraine type, the origin of the trouble could frequently be traced to the nose. An hypertrophy of the middle turbinate was often associated with a marked convergence insufficiency.

Dr. WOODWARD related the case of a patient who had premonitory symptoms of glaucoma, recurring, and also right supra-orbital neuralgia. He opened the right frontal sinus, in which he found granulation tissue. He removed the lining of the sinus and drained into the nose, and also curetted the antrum of Highmore. The patient has never had any symptoms of glaucoma or supraorbital neuralgia since.

Dr. LINN EMERSON had seen eye symptoms follow sinusitis, and he always examined for nasal trouble in cases of asthenopia.

Dr. MEIERHOF believed that there was no question that the etiology in many cases of eye disease needed clearing up,

especially the optic-nerve affections occurring at puberty, and that possibly some of these obscure cases would be found associated with sinus disease.

MONDAY, MAY 21, 1906. PRESIDENT, DR. WILBUR B. MARPLE, IN
THE CHAIR.

Dr. CARL KOLLER presented a patient with gunpowder burns of both eyes, followed two weeks after the injury by complete circular ulcers of the corneo-scleral margin with undermined edges. The ulceration spread centrally, with retraction of the undermined flaps, until only small central disks of cloudy but intact corneal tissue remained. The process was finally arrested after cutting off the undermined edges. In healing, the retracted corneal disks became larger, stretched by the cicatricial tissue, and vision improved to 6/60 in the right eye and the counting of fingers at two feet in the left.

Dr. JOHNSON asked whether the trimming of the edges of the ulcer had caused the healing to take place.

Dr. KOLLER stated that although healing had taken place after the edges had been trimmed, he did not think that the healing was caused by the trimming.

Dr. DAVID WEBSTER presented a **case of cataract caused by vibratory massage, intensified by application of electricity through fluid.**

The patient was fifty-three years of age, a miner by occupation. He had three severe attacks of iritis in his left eye and several mild attacks. The first attack was in 1884. Dr. Webster first saw him in 1896. The patient still has vision of 20/20 in the left eye. In 1900, the attacks of iritis were shifted to the right eye, and in 1901 he had a second severe attack of the right eye and three attacks in 1902, followed by slight optic neuritis and some thin opacities of the vitreous. In March, 1902, after an absence of about six weeks, he returned with exclusion of the right pupil, "bombé" iris, and "crater" pupil. The iris had not begun to bulge when the eye was examined in Chicago a few days previously. Dr. Webster performed an iridectomy upward. After a week the patient was discharged with the eye white. He was next seen in April, 1906; the vision of the right eye was 2/200; he had a cataract in this eye which had first become visible about a week previously. He had used electrical vibratory mas-

sage on the eye three times. Each time the patient stated that it darkened the eye, but the vision cleared up the first two times. It took a week or more to clear up completely. He had used, about ten days after the vibratory treatment, three or four times, an application of electricity through a solution of iodide of potassium, 20 minims of the saturated solution to about $1\frac{1}{3}$ oz. of water. This solution was kept in contact with the eye by means of an eye cup of his own contrivance, and an electrical current taken from an ordinary incandescent light passed through it and the eye-for about four or five minutes at a time. The positive pole was in the solution and the negative on the back of the neck. In May, 1906, the cataract was ripe; good field of perception. Ever since the last attack of iritis the patient had noticed a large floating body attached to the temporal side of the fundus, floating like scum on the surface of water, weblike, and thickened in two places near its attachment. The web is over the pupil when the eye is at rest.

Dr. CARL KOLLER had read of cataract being produced in rabbits by the vibration of tuning-forks.

Dr. WILBUR B. MARPLE mentioned a case with peripheral opacities of the lens which had developed cataract in both eyes by the vibrations produced by a powerful vibratory apparatus. One lens was much swollen and the other partly dislocated.

Dr. E. B. COBURN stated that probably not more than 10 to 15 milliamperes could have passed through the eye.

Dr. J. H. CLAIBORNE had seen cups which produced a vacuum, making and breaking connection, cause conjunctival hemorrhage and swelling of the lids, but no change in the lens or retina.

Dr. T. R. POOLEY presented a case of **epithelioma of the eyelid and globe**, which was especially interesting because he could give the result obtained by X-ray treatment, extending over a period of nearly three years. The patient was a woman of seventy years who consulted Dr. W. J. Morton, April 3, 1903. There was no family history of cancer. Twenty years ago the disease began as a pimple on the side of the nose, which extended to the eyelid. Two and a half years before, growth was removed, but returned in two months. Three months before going to Dr. Morton, she saw Dr. Wilson, of Bridgeport, who sent her to Dr. Morton for X-ray treatment. At this time the case was considered inoperable as the ulcer involved the entire lid, the eyeball, and orbit. She was treated from this time on by X-ray three times a week until July

29, when the ulceration and induration of the lower lid were entirely gone and the skin was soft and flexible like natural skin, and the case was discharged as cured. In Dr. Morton's notes the condition of the eyeball at this time is not noted.

In May, 1905 (seven months), she returned with a recurrence which she first noticed six months ago. The ulceration had rapidly progressed, destroyed about half of the upper eyelid, and extended into the orbit. X-ray and radium treatment again resorted to, with good result so far as the lids were concerned, but the eye was lost. At this time Dr. Pooley was consulted, October 24. The lids were apparently healed, but there were phthisis bulbi, nodular infiltration of the cornea, and evident invasion of the orbit. The lids were sunken in and adherent to the shrunken globe, especially the lower lid. Enucleation was advised. Done on November 13th. Operation difficult because of the adhesions of the globe; the vitreous was lost by cutting the sclera; all the suspicious tissue on the nasal side of orbit removed as well. The result was rapid healing with complete closure of the palpebral fissure. Since then she has had a continuance of the X-ray treatment until quite recently. There now seems to be no evidence of the return of the growth.

Dr. POOLEY stated the principal point of interest from a clinical standpoint to be: the occurrence of a relapse severe and extensive in character after a seven months' discontinuance of treatment. He thought that the case showed the necessity for careful observation for a long time even after apparent cure to prevent relapse, and that, if the size and situation of the growth permitted, he would place more confidence against recurrence in a surgical procedure, entire removal of diseased parts, and a plastic operation to cover the defect, than X-ray or radium treatment.

Another point was that the pathological examination of the eye showed that this treatment, while it caused the disappearance of the superficial part of ulcer, did not favorably affect its development in the eyeball.

Dr. E. B. COBURN demonstrated the pathological examination of the eye treated by X-rays by Dr. T. R. Pooley.

The eye was completely collapsed when received, and the vitreous had escaped. The eye was prepared for examination in the usual way, and the microscope revealed the following conditions: the conjunctiva, the greater part of the cornea, and the

tendons of the external ocular muscles were invaded by a new growth of the type usually characterized as epithelioma.

At no point had the tumor made any appreciable invasion into the sclera from the muscular attachments, but the growth from the conjunctiva had penetrated into the ciliary body at one part, having followed evidently the path of one of the anterior ciliary arteries. The ciliary body was, however, slightly involved. At some period there had been a perforating ulcer of the cornea with incarceration of the iris. This had healed, but the new growth had extended into the scar tissue and into the iris. The lens was only apparent by the remains of the capsule.

The choroid and retina were detached, and with the ciliary body presented the usual appearance of such structures in phthisical eyes.

There was considerable infiltration of the conjunctiva and cornea with round cells, but whether these were caused by the raying, or were an indication of the inflammatory type of the new growth, it is impossible to say. Other than this the only indication of the effect of the X-ray treatment was an occasional vacuolization of the superficial epithelium.

Dr. W. E. LAMBERT had seen two cases in which epithelioma of the lid had been removed and then recurred. Dr. G. S. Dixon had employed the X-ray in these cases with results that had been satisfactory so far.

Dr. DIXON stated that in the first of the cases referred to by Dr. Lambert a small nodule remained well up in the orbit, which had been subjected to three treatments with medium tubes at nine inches. In three weeks the small nodule began to disappear, and is now about gone. The second was an extensive epithelioma of the lower lid, which was in process of breaking down. The ulcer healed in the centre, but the nodules were left at the ends of the periphery of the growth. The nodules were broken down with forceps, and then under the X-ray healing of the broken-down nodules took place. Experience with deep-seated tumors of the epitheliomatous character was not very satisfactory. Recurrence was almost certain, but the X-ray could always relieve the pain very greatly.

Dr. E. L. OATMAN had seen two cases that had been treated by the X-ray and pronounced cured. Recurrence took place, and a plastic operation was performed. He believed that recurrence was the rule.

Dr. J. H. CLAIBORNE had seen X-ray tried for two months after recurrence following plastic operation. He believed it to be good for superficial ulcers, but not for deep tumors.

Dr. E. B. COBURN thought that we had little to hope for in X-ray, and it seemed to be generally falling into disuse.

Dr. E. GRUENING reported a case of **zonular cataract in which he had extracted a perinuclear zone.**

The patient came to Mt. Sinai Hospital in October, 1905, with zonular cataract in both eyes. Visual acuity, 10/200 in each eye, although she could read moderately large print when her pupils were dilated. The right eye had divergent squint about 40° . The extraction was done on the squinting eye. An incision of about 7mm was made at the sclero-corneal margin; with a Graefe cystotome the capsule and the clear layer of lens were cut. With slight pressure the perinuclear zone could be removed, and some clear lens substance evacuated. The iris was not excised. The remaining cortex was absorbed in about two months. The dissection of the secondary cataract was practised later. The patient now has a central circular perfectly black pupil, with correcting lens; vision equals 20/20. The eye was straightened by a tenotomy and advancement.

Dr. CARL KOLLER stated that it certainly was very interesting that the lens in this case should have split into layers, the opaque zone coming out and the clear zone remaining.

Mr. DAVID WEBSTER thought that the clear zone might also have been evacuated at the time of the operation.

Dr. E. S. THOMSON had had the experience of seeing the entire perinuclear zone go into the anterior chamber after needling.

Dr. W. E. LAMBERT presented two cases of **foreign body in the globe**, and also a case of **high myopia with extraction of the lens.**

The first case, a male, sixty-eight years of age, residing in Troy, N. Y., was hammering a piece of steel on April 28th. A piece flew off and struck him in the eye. He was admitted to the Infirmary on May 1st. There was a small wound in the cornea, on the temporal side, right eye. Also a small opening in the iris. Lens cataractous. Skiagraph showed presence of a foreign body, size estimated $2 \times 1\text{mm}$; located as being 22-25mm back of the centre of the cornea; 5mm below horizontal plane; 4.75mm to nasal side of vertical plane. The eye was cocaineized, and

placed before the large magnet. The body was drawn into the anterior chamber just behind the iris. A small iridectomy was then made upwards, and the steel withdrawn with the Hirschberg magnet. The patient made an uninterrupted recovery, and was sent home. He has subsequently returned, and the cataract, which was a senile one, was removed. It is a little early yet to test his vision, but he should, in all reasonable probability, have excellent vision.

The second case, a male, aged thirty-six years, was struck in the left eye on May 1st by a piece of steel which he was hammering. He was sent to the infirmary on the same day. A small opening was seen near the corneo-scleral junction, a little below the horizontal meridian, temporal side. The skiagraph showed the presence of a large foreign body, size apparently $2 \times 4\text{mm}$, and the shadow suggesting that the foreign body was irregular. Located 9.75mm back of the cornea; 8mm below the horizontal plane; and 5mm to the nasal side of the vertical plane. The eye was cocainized, the original opening enlarged, and iridectomy was made, and with a Haab magnet the piece of steel was withdrawn. There was a considerable hemorrhage into the anterior chamber, and a slight prolapse of the ciliary body into the wound. The patient was put on hot bathing, atropin, and argyrol. The eye gradually quieted down; the hemorrhage absorbed; and on the tenth day the man left the hospital at his request, contrary to advice.

The third case was that of extraction of lens in high myopia. Female, aged sixteen years, vision O. D. = $5/200$; O. S. = $15/200$. Under a mydriatic, skiascopy showed a myopia of 22 dioptries, with a small amount of astigmatism in the right eye, and 19 dioptries in the left eye. Vision: right eye, $20/70$ with -20 ; left eye, $20/70$ with -18 .

She had been wearing for ten years glasses O. D. -15 ; and O. S. -13 . Suffering a great deal of discomfort, however, with the glasses, and her vision with them not being satisfactory, she consented to have an operation. On May 3d, under cocaine, the lens in right eye was needled. May 4th, some slight reaction. May 5th, complained of severe pain. Tension, $+2$. Lens very much swollen and opaque. Under cocaine, incision was made with lance-shaped knife into the clear cornea, all soft lens matter extracted, anterior chamber irrigated freely with normal salt solution.

The following day the anterior chamber was restored, eye quieted, tension normal, and no pain. Patient was kept in the hospital until the 15th, by which time all the remaining soft lens matter had been absorbed. An incision of the capsule was made with Knapp's knife needle a week later, clear black pupil being obtained as the result. The patient now has a vision of 20/30 with a $+1$ spherical combined with a $+1$ axis 90.

Dr. W. B. MARPLE presented a case of **plastic operation for restoration of the cul-de-sac.**

He had operated upon the patient for formation of a cul-de-sac three weeks ago. The lad had lost his eye by the burn of a sky-rocket, and the culs-de-sac, both upper and lower, were entirely obliterated, and the lids were adherent together. He had found nothing but scar tissue in the orbit. He had employed the technique suggested by Dr. Weeks, except that, after he had stitched the Wolff graft into position with three stitches, he had also passed a thread with a needle at each end through a hole near the upper edge of the rubber plate, and then brought these needles out on the brow, after passing them through the graft and through the fascia at the orbital margin. These threads were then tied firmly over a pledget of gauze, and served to hold the plate and also the graft firmly up against the orbital ridge. This seems to be a decided advantage. The graft took *in toto* (he had only attempted to restore the upper cul-de-sac at this operation) and there was a very deep upper cul-de-sac, as deep as is usual after enucleation of an eye.

Dr. C. W. CUTLER reported a case of **uveitis with hyperpyrexia in which large doses of salicylate had been used.**

The patient, aged twenty-seven years, a Hebrew, well-nourished, of good habits; no recent illness, and no history of venereal disease.

About November 20, 1905, he noticed that right eye was blurred. Ten days later there was slight scleral injection, not limited to the ciliary region, a few large spots on Descemet's membrane, and some grayish exudate along the vessels at upper edge of optic nerve. V. O. D. = 20/40. O. S. = 20/30 $+$. Given K. I. in increasing doses.

December 10th.—O. D.: Cornea dull, aqueous cloudy, pupil dilated with atropin. Vitreous filled with opacities. Vessels seen only above nerve. O. S.: A few large dots on Descemet's membrane. Vitreous hazy, feathery gray exudate over vessels above

the nerve. Veins much dilated, nerve red, not swollen. V. O. D. fingers three ft. O. S. 20/30. Given sod. salicyl. gr. xx., q. 2 h. The first dose at 6 p. m., December 10th, and during the next eighteen hours he received 4 drachms.

Urine: sp. gr. 1.022, large sediment of urates, no albumin, no sugar, excess of indican. There was profuse perspiration during the night.

December 11th.—The temperature rose, as shown by the chart, until it reached 108.5° rectal. Salicylates stopped. Phenacetin gr. x. and ice-alcohol sponge given for two hours, after which the temperature fell quite rapidly. The pulse was about 200. The patient was in a stupor, and there was involuntary urination. There was a small, red, macular rash on chest and back and some on the face, arms, and legs. Meningitis was feared, but there was no refraction or stiffness of neck. The rectum was irrigated q. 3 h., and much undigested food, mucus, and gas returned.

December 12th.—Mental condition improved. Drowsy, rash fading. Temperature, 99° to 100°. Given salol gr. v., q. 4 h. During the night the temperature rose to 101°, and there was some delirium, with delusions of flying and moving objects in the room and noises in the house. Salol stopped and bromide given, but was wakeful for forty-eight hours; then slept, and mind became clear and temperature normal.

The vitreous opacities cleared slowly, so that fundus could be seen in both eyes. There was much soft-edged, gray exudate covering the vessels in places, and the retina in general seemed swollen and nerves red.

January 3d.—As the eyes improved slowly, salicylic acid and sod. bicarb. ʒʒ gr. x. were given t. i. d., care being taken to order that derived from the oil of wintergreen. The sodium salicylates previously used had been Merck's Synthetic. On the following day, January 4th, temperature by mouth 100°, after that it became normal and remained so. The medicine was continued for ten days.

January 14th.—V. O. D. = 20/20. O. S. = 20/30. Media clear, retina normal, except for a slight appearance of œdema in places.

This case is singular in its acute course, its association with high temperature, and its short duration. The prodromal stage, if I may call it so, lasted nearly three weeks, beginning, as do

most of the cases of uveitis, without constitutional symptoms and apparently without fever.

The patient was about his work until the second eye became affected. At this point there seemed to be a fresh and more virulent invasion or exacerbation which yielded promptly to treatment, and the eyes gradually returned to the normal.

Are these relatively mild infections due to pyogenic organisms which have lost their virulence, or to non-pyogenic organisms, such as those supposed to cause rheumatic fever or influenza, or to toxins? Either is possible.

Lenhartz states that in general sepsis, many of the so-called "bland infarcts" in the capillaries of the brain and kidneys are filled with streptococci and staphylococci, although the tissues appear normal.

Goh described a mild case of pneumococcus infection with small infiltrations and a retinal hemorrhage. In a number of cases no organisms have been found, and the vessels were free from infectious material. The toxins, of course, elude observation, so it is useless to theorize as to the precise etiology of the uveitis. In several cases of acute uveitis, in which Dr. Cutler has had the blood examined, there has been no leucocytosis. Indican has been present, and in several cases there has been a little albumen in the urine. It is to be classed in general as a manifestation of sepsis arising from some focus which may not be discovered.

Another class of subacute or chronic uveitis resembles the cases of subacute nephritis, which indicate the presence of an irritant material in the blood. It is not necessary to assume that the nose and the neighboring sinuses are the sources of infection because of their proximity, and in my experience the association is infrequent.

In this case the hyperpyrexia and the prompt response to salicylate suggest a rheumatic affection. Dr. Cutler has seen several cases, one with acute tonsillitis, and uveitis of the same nature apparently as the present case, though less virulent, which yielded in the same way, but in most cases of chronic uveitis the salicylates seem to be of little value. It is interesting to note that cases are on record in which salicylic compounds have caused a rise in temperature.

Lewin (*Die Nebenwirkungen der Arzneimittel*, p. 503) describes this paradoxical elevation as generally beginning with a chill and

lacking the usual sweating. As in this case there was no chill and sweating was profuse, the drug had probably no influence in causing the fever. The problems of uveitis are most interesting, and since we can, as a rule, approach the disease only clinically, it is important that the different types should be carefully noted and reported until a wider knowledge may permit their definite classification. Especially is it important to consider all cases of uveitis as part of a general constitutional condition.

Dr. E. L. MEIERHOF thought that the rise in temperature had been due to the large doses of salicylate.

Dr. E. S. THOMSON presented a case of **keratoconus, operated on by removal of the apex of the cone.**

The patient, a man aged twenty-eight years, came to the hospital two months ago complaining of failing vision. The right eye had very well-marked keratoconus, with vision of fingers at one foot. The left eye had also keratoconus, with vision 20/200. He was admitted to the hospital one week later and the right eye operated upon.

Two needles threaded with fine catgut were carried through the cone, and then a piece of the catgut, about 4mm in diameter, was excised by transfixion with a Graefe knife, completing the section with scissors. The sutures were left in for a week, and though the anterior chamber was well restored, when the sutures were removed the wound was found to be only slightly adherent and reopened for half its extent. Under treatment, however, it healed in the course of a week, and he now has vision of 20/200 in the eye, with a small cicatrix 3mm in diameter below the centre of the cornea. The cicatrix is still growing smaller.

Dr. H. W. WOOTTON presented a case of **vernal catarrh.** The conjunctivæ of both upper lids were covered with characteristic flat-topped granulations resembling paving stones set close to one another. The surface of the granulation was pale, and there was some secretion. The lower lids were not affected, and there were no circumcorneal swellings. The patient had first noticed his trouble in the early spring and the symptoms have been getting progressively worse as the hot weather advanced. There was considerable lachrymation and some photophobia.

Dr. E. L. OATMAN had removed some of the granulations, and the following is his report of their microscopic examination:

Pathological Examination.—The specimens consist of loosely

arranged, thick bands of fibrous connective tissue and connective-tissue cells of varied forms. The relative proportion of fibrous tissue to cells varies in the different specimens. The surfaces of the growths are covered with irregularly thickened layers of epithelium, which is proliferating inwards in the form of long digitations. Some growths are very vascular, others contain a few blood-vessels. The most marked feature is infiltration of the tissues with eosinophile leucocytes. They are found everywhere, but are most numerous just below the surface epithelium. Eosinophile infiltration of the tissues serves to distinguish this disease. They pass out through the walls of the blood-vessels, travel in the lymph spaces to the surface, and escape by squeezing themselves through the interspaces of the epithelium. Vesicular spaces exist in the superficial layers of the epithelium. Dr. Oatman was unable to trace any connection between the eosinophiles and spaces. Eosinophiles are found in great numbers in the secretion from eyes affected with these growths.

REPORT OF THE PROCEEDINGS OF THE OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

BY MR. C. DEVEREUX MARSHALL.

THURSDAY, MAY 3, 1906. PRIESTLEY SMITH, F. R. C. S., PRESIDENT,
IN THE CHAIR.

Mr. MACKENZIE DAVIDSON read a paper on **radium in the treatment of rodent ulcer.**

He gave a short description of radium and its source and then gave details of how he applied it, and the results he had obtained in the somewhat large number of cases which he had had under his care.

As a rule he found it unnecessary to apply the radium very frequently. In many cases cure had been effected with one or two applications with several weeks' interval between the applications. In other cases more frequent application was necessary.

The radial activity of different specimens of radium varied, but it was possible by means of an electroscope to measure this. He preferred to use it when encased in a sealed glass tube, for the glass shut off some of the harmful rays which would burn the skin, and which were of no use for destroying the rodent cells. The power of radium was for practical purposes a fixed quantity in any one specimen, so that the dose given was an absolutely known quantity; in this way it differed considerably from the X-rays which were not constant, but depended upon a variety of circumstances.

Mr. RANSOM PICKARD (Exeter) described a case of **implantation cyst containing wood fibres.**

The patient was a girl aged fourteen, and the tumor had been noticed for nine years. It was *3mm* in diameter, and was situated below the pupil. The growth was removed, and its base was found to be composed of granulation tissue containing three wood fibres

of coniferous origin. The tumor consisted of epithelial cells, and contained several cysts, some of which were formed by degeneration of the cells, and others by the formation of fissures. There was no history of injury to the eye, the cornea was quite normal, but in all probability the cornea had become perforated ten years ago by a fine splinter, for at that time she fell and struck her nose against a table.

Messrs. TREACHER COLLINS and JOHNSON TAYLOR (Norwich) described a case in which there was a cystic swelling occupying the position of the left eye, and apparently mainly formed by a bulging forward of the conjunctiva of the upper lid. It was present at birth and had steadily increased since.

Mr. Johnson Taylor first saw the child when three weeks old. He then tapped the cyst with a fine trochar and canula; it refilled the following day. When next seen about a year later, it had increased considerably in size in all dimensions; it stood out $2\frac{1}{2}$ inches from the orbital rim and gave a most unsightly appearance. Blood and discharge had also been exuding from it for two months.

Under a general anæsthetic Mr. Johnson Taylor removed it entirely and handed it over to Mr. Treacher Collins for examination.

The examination showed that the cyst was due to an enormous distention of the whole globe, the sclerotic forming its outer wall. The inner coat corresponded to the retina, but in no place did that portion derived from the secondary optic vesicle lie in contact with that developed from the outer layer. The anterior portion of the cyst was lined by the former, and the posterior part by the latter. The cavity of the cyst was composed of a space between these two layers, the cavity of the primary optic vesicle.

The explanation of the formation of the cyst was apparently the imperfect involution of the primary optic vesicle which forms the secondary optic vesicle. There had been some attempt at involution both anteriorly and below. Anteriorly the inner wall of the cyst was prolonged backwards in a fold at the bottom of which was a rudimentary lens, so that at one stage there must have been some downgrowth of surface epiblast. Below was a mass of atypically developed vitreous, and the expansion of the cyst below must have been checked by this upgrowth of meso-blast, hence the chief distention upwards into the upper eyelid.

As the whole of that portion of the retina which normally forms the inner layers was in the anterior part of the cyst, it is not surprising that no optic nerve was developed. The lens showed a defect in its posterior capsule, and through this gap mesoblastic tissue had extended forwards and become mixed with the lens fibres. A nodule of hyaline cartilage was found in the sclerotic at the posterior part of the specimen.

THURSDAY, JUNE 14, 1906. PRIESTLEY SMITH, F.R.C.S.,
PRESIDENT, IN THE CHAIR.

Mr. NETTLESHIP and Mr. MENTEITH OGILVIE gave an account with diagrams and drawings of a family, in which twenty persons in four generations had a peculiar variety of partial congenital stationary cataract in the form of a perfectly circular, well defined, homogeneous or finely granular layer, of no great density, situated between nucleus and posterior pole, about 4mm in size. At first sight it might be taken for a small lamellar cataract, but the invariable absence of any trace of a second layer and the certainty that the opacity lay behind the nucleus negatived that diagnosis, whilst there was equally good evidence that it lay in front of the posterior pole.

Some of the cases were first seen by Mr. Doyne, at Oxford, several years ago. These were re-examined by Mr. Ogilvie and were found to be unaltered, and he has recently discovered a large number of new cases. The change caused but little loss of visual acuteness, and only a slight desire to shade the eyes against bright light; hence the number of cases could only be determined by ophthalmoscopic examination of every accessible member of the family. Mr. Ogilvie examined about 150 persons, whilst one group, living at Edinburgh, was examined for the writers by Mr. G. Mackay. All the cases occurred in one branch of the family tree.

Mr. SIMEON SNELL (Sheffield) read a paper on **steel alloys which are not magnetic**. He mentioned that during recent years, steel alloys had been used in certain industries, and that these alloys had altogether different magnetic properties to ordinary iron or steel. Manganese steel, which contained 12% of manganese, 87% of iron, and 1% of carbon, formed a very hard steel which was difficult to machines, but the point of interest was that it was non-magnetic. Its toughness made it useful for many purposes.

Nickel and iron was another alloy, and this was as susceptible to magnetism as pure iron, but the admixture of a small percentage of manganese and carbon completely altered the magnetic properties. Thus a mixture of carbon 0.4%, nickel 20%, and manganese .9% with iron was absolutely non-magnetic. Another point was that if this same alloy were quenched in liquid air it became magnetic.

Another alloy was chromium steel. It was magnetic, but less so than ordinary steel. Specimens of these were exhibited, and their magnetic peculiarities were demonstrated.

Mr. Snell remarked that fortunately the vast bulk of all steel splinters penetrating an eyeball came from steel which was magnetic, and therefore the use of the electro-magnet was unaffected. The possibility of steel being non-magnetic should be borne in mind, and enquiries made as to the particular kind of steel from which the fragment injuring the eye became detached.

In conclusion Mr. Snell referred to other alloys which were highly magnetic. He had not, however, yet found that they were more magnetic than the soft iron in use had been.

Messrs. L. V. CARGILL and S. MAYOU described a case of **miliary tuberculosis** in an adult in which there was tubercle of the choroid with implication of one optic disk. The patient was a man aged twenty-one who was admitted into King's College Hospital in December, 1905. Although previously healthy, he had been feeling unwell for six weeks, and was supposed to be suffering from influenza. He perspired a good deal, was feverish, and was losing weight. There were no physical signs in the lungs, and no tubercle was found in the expectoration or blood. Opsonic index to tubercle was 1. Two weeks later an irregular yellowish white patch was found in the right eye near the disk; it was only slightly elevated and there was no pigment. In the left eye there were signs of optic neuritis. The irregular pyrexia continued, and signs developed in the lungs. On February 17th, tubercle bacilli were first found in the sputum, and death occurred three days later. The post-mortem showed that the meninges were studded with tubercle, so also were the lungs and most of the abdominal viscera. The sections of the eye showed a typical tuberculous mass situated at the edge of the choroid on the outer side of the optic nerve; this mass involved the nerve, and spread backwards through the lamina cribrosa. The anterior part of the globe was normal except for a congenital anterior synechia.

FRIDAY, JULY 13, 1906. PRIESTLEY SMITH, F.R.C.S., PRESIDENT
IN THE CHAIR.

Mr. A. R. BRAILEY read a paper on **congenital distichiasis**, and gave a clinical description of a case, together with the result obtained by making a microscopical examination of a small portion of the lid. The chief point of interest was the fact that the Meibomian glands were apparently completely absent, and their place was taken by hair follicles. He then gave a description of four other cases seen in the clinic of Professor Fuchs in Vienna. These were the only cases seen there during a period of twenty years, and showed how rare this deformity was. He also described a case reported by Kuhnt.

He drew attention to the distinction which should be recognized between trichiasis and distichiasis, and urged the advisability of limiting the latter term to the congenital cases. He gave a list of other cases which had been reported.

Dr. C. H. USHER (Aberdeen) read a note on the **choroid at the macular region**. He drew attention to the fact that in sections of the eyes of albinos examined by Mr. Nettleship, and shown at a meeting of the Society in November last, the pigment was present in the choroid, but limited to the yellow-spot region.

He had since examined eleven normally pigmented eyes, and had found (1) a deeper pigmentation of the retinal epithelium at the yellow-spot region, and an increased thickness of this layer; (2) a marked increase of the pigmentation of the choroid; and (3) an increase in the thickness of the choroid.

From the above observations it might be expected that if pigment were present at all in an albino's eye, it would be found in the macular region.

Dr. USHER also read a paper on a case of **unilateral white eyelashes and tufts of hair**. The patient was a girl, aged three years, whose eyelashes on the left side were quite white, and she also had two tufts of white hair on the left side of her head. There was nothing else abnormal in the mother or child, and the pregnancy was normal in every way. The condition was first noticed about the third day after birth. All the eyelashes on the right side were light brown in color, so also was the greater part of the hair of the head. The family history was carefully investigated, and although there were some albinos in the family, yet no other member seems to have had this peculiar condition.

BOOK REVIEWS.

XIII.—Serumtherapie bei infectiösen Augenerkrankungen. (Serum Therapy in Infectious Eye Diseases.) By Prof. THEODORE AXENFELD, Freiburg. Monograph, p. 89. U. Hochreuther, Freiburg i. B., 1906.

The reasonable sequence of the discovery of bacteria is to be found in etiological therapy and prophylaxis. The advances in immunity and specific serum therapy have resulted in the application of specific sera also in ophthalmology against certain infections occurring in the eye. This monograph in the author's characteristic painstaking manner reviews most instructively the present status of serum therapy in eye diseases.

Serum therapy against diphtheritic infection. The results of serum therapy against infection of the eye with diphtheria bacilli have been most successful. This chapter commences with general clinical and bacterial data on diphtheritic conjunctivitis. On page 11 it is stated that animal inoculations are necessary to differentiate the virulent from the non-virulent (xerosis) diphtheria bacilli, which as is well known are constant inhabitants of the conjunctiva. (This differentiation can, however, be made in a much simpler way by means of fermentation tests.¹—*Reviewer*.) The favorable influence exerted by the serum injections does not hold good for previously existing corneal infiltration. Though the conjunctival process is arrested, the corneal process may go on to destruction of the cornea, presumably because this ulceration is usually due to a secondary infection with pyogenic organisms. Though cases of diphtheritic infection may run a very mild course, it should be stated, as a rule, that in all cases of pseudo-membranous conjunctivitis with Loeffler's diphtheria

¹ "The Differentiation of *Bacillus Diphtheriæ*, *Bacillus Xerosis*, and *Bacillus Pseudodiphtheriæ*, by Fermentation Tests in the Serum-Water Media of Hiss." ARNOLD KNAPP, M. D. *Jour. of Medical Research*, vol. xii., No. 4, 1904.

bacilli, serum should be at once injected. The serum is best applied subcutaneously. Finally recent investigations at the Freiburg clinic are reported which show that the xerosis bacillus has no etiologic significance for chalazia, and that the non-identity of this organism with the virulent diphtheria bacillus is further shown as diphtheria antitoxin has no effect on lesions where the pseudo-diphtheria bacillus has been found present.

Serum therapy against pneumococcic infection of the eye. The most important pneumococcus infection in the eye is the serpent ulcer of the cornea (hypopyon keratitis), though the typical clinical picture is exceptionally produced by other organisms. The treatment of this condition with serum is entirely due to Roemer's excellent work. The difficulties of a successful immune serum against pneumococci in general were of course also present in its application in ophthalmology. Roemer endeavored to overcome these difficulties by using a polyvalent serum (a mixture of sera from animals immunized by various strains); he then experimented with an "anti-aggressin"¹ serum.

Passive immunity (sera of immunized animals) was first tried. This seemed of greatest value prophylactically; its success in active ulcers of the cornea was much less. Active immunization (dead cultures) was also followed with some success; but the combination proved to be the most potent; 175 cases of serpent ulcer of the cornea are carefully tabulated. The results are not decisive; further experiments are necessary. In the application of this combined method the injection of culture (intramuscular) and of serum (subcutaneous) must occur at the same time.

Post-operative pneumococcus infection would furnish a field for successful serum therapy. Prophylactic serum injection has been practised by Axenfeld in cases where from infected conjunctiva, difficulty of operation, or poor physical state of patient, subsequent infection seemed liable. This question also demands further investigation. After access of suppuration the serum injection had no effect.

In conclusion the author states the Roemer's serum unquestionably exerts a curative action in many cases; prophylactically

¹ Bail (quoted on page 36) found that filtered peritoneal exudates when injected into a second animal caused at first increased susceptibility to typhoid infection ("aggressin"), later an immunity against this infection greater than that obtained by the other methods, the so-called bactericidal immunization. Wassermann has reported that this effect can be obtained directly from the bacteria by autolysis.

it is especially to be recommended. When the disease is well-marked, serum therapy should alone be relied upon only at the very onset. If the condition progresses or in advanced cases, the older methods, galvano-cautery or the Saemisch section, must be resorted to. Its use is therefore at present very limited. In any case the work which has been done along these lines is most creditable. The field of application will be enlarged as soon as a more uniform and a more active serum is obtained.

Serum therapy against streptococcic infection. Conditions of this kind demanding treatment in ophthalmology are rare. Moreover the difficulties of producing an active antistreptococcic serum are even greater than for the pneumococcus. The same applies to the staphylococcus.

Serum therapy is a fruitful field for scientific research and deserves further investigation.

A. K.

XIV.—The Combined Treatment in Diseases of the Eye.
By G. HERBERT BURNHAM, M.D., Prof. of Ophthalmology and Otology at the University of Toronto. Published by H. K. Lewis, London, 1906. 92 pages.

This monograph is on a line of treatment for certain diseases of the eye which Dr. Burnham has developed into a routine method. The "combined treatment" consists in the administration of pilocarpin, mercury, and iodide of potassium. Pilocarpin is given hypodermically in doses from gr. $\frac{1}{8}$ to gr. $\frac{1}{4}$. The injections are repeated daily for six weeks in the severe cases. In ordinary cases the injections are continued 10 to 21 times. After a pause the course of injections is repeated. The treatment can be continued for years as long as there is an improvement in the eye-condition. In the author's opinion, timidity in the use of pilocarpin is groundless. The unpleasant effects are due to the liver rather than the heart, and disappear on the continued use. Careful directions are added on the best method of giving the sweat, on the arrangement of the bed, and on the general management of the patient. The adjuvants of this treatment consist in a combination of mercury and the iodide of potassium. The mercury is given as follows :

℞ Hydrarg. cum cret., gr. j.
Pulv. opii, gr. $\frac{1}{10}$
Pulv. ipecac., gr. $\frac{1}{10}$. M.

One tablet to be taken three times a day. The iodide of potassium is given in doses of five to fifteen grains three times a day.

To obtain the best results with the combined treatment, a routine of administration must be methodically followed in every particular.

The rest of the book is given over to a description of many forms of ocular affections which were improved by this treatment in the author's hands. Among these diseases are cases of iritis, irido-cyclitis, optic neuritis, various forms of corneal diseases, corneal ulcerations, and keratoconus. The remedy has not been of any avail in detachment of the retina.

We owe Dr. Burnham a debt of gratitude for this careful description of a line of treatment which possesses such great physiological possibilities. We would especially call attention to the importance of a routine administration insisted upon by the author. In the reviewer's experience during the past winter, this treatment in four cases of sympathetic iridocyclitis, followed out more or less on the lines laid down by Dr. Burnham, has given very satisfactory results.

A. K.

ARCHIVES OF OPHTHALMOLOGY.

PREVENTION AND TREATMENT OF EYE AFFECTIONS FROM VENEREAL DISEASE.

ADDRESS DELIVERED, BY INVITATION, OCTOBER 18, 1906, BEFORE
THE PHILADELPHIA SOCIETY FOR THE STUDY AND
PREVENTION OF SOCIAL DISEASE.

BY HERMAN KNAPP, M.D., NEW YORK.

A.—GONORRHOIC EYE-DISEASE.

LADIES AND GENTLEMEN:

As soon as the new-born child has filled its lungs with a cry, announcing its individuality as an independent being, its eyes, in a certain number of cases, are threatened with blindness. After its first bath the eyes look all right, but soon the eyelids swell, become shining red, and a white slimy liquid oozes through the fissure of the lids. On the first day little or no discharge is perceptible, and the eyes are bright, the cornea, iris, and pupil intact, but from day to day the disease grows worse. The swollen scarlet lids are smeared with white paste and liquid or creamy pus. When cleaned and opened they discharge a small stream of pap-like secretion. Now the cornea (the hard and transparent coat) is dull, and the iris and pupil are clouded. The conjunctiva (the soft mucous coat lining the inner surface of the lids and the outer of the eyeball) is thickened, and covered with creamy pus. In this stage the eyes can still be saved.

The next stage shows ulcers on the cornea which are apt to perforate it, and then the poisonous discharge may creep into the interior of the eye and damage the delicate structures to such a degree that sight is forever more or less

destroyed, and the eyes are so disfigured that the parents ask to have them removed and artificial ones inserted. In the statistics of blindness, this dreaded disease—the infective purulent conjunctivitis—was formerly credited with the highest percentage, but a savior came in the person of *Dr. Credé*, who instilled preventive drops into the eyes of all babies in the Maternity Clinic of the University in Berlin as soon as they were born. He first has *the eyes* cleansed, even before the navel-string is cut, then he lets fall one or two drops of a 2 per cent. nitrate of silver solution on both corneæ of each baby in such a way that the whole conjunctival sac was disinfected; thus the destructive disease did not break out.

Dr. Credé was my teacher in 1853 and 1854; he was no ioculist, but an obstetrician, a young lecturer at the University and an assistant to the Maternity Clinic in Berlin, but it was later that he introduced his method to prevent this dread eye-disease of the new-born. He was born in Berlin, 1819, but his whole personality was French. He was small, with black hair and eyes, polite, agreeable, animated, and always composed and kind. His ancestors were probably among the Huguenot-Protestants who had been exiled from France, and whom King Frederick II. of Prussia welcomed with the motto: “*En mon royaume chacun peut être sauvé à sa façon*” (In my kingdom every man can be saved according to his fashion).

Dr. Credé left Berlin, following a call to the professorship of obstetrics at the University of Leipsic. He found in the Leipsic Maternity, on an average, 10.8 per cent. of blind children; after the introduction of his prophylactic measure he had 0.1–0.2 per cent. (Prof. E. Fuchs of Vienna).

In the year 1876 there were in twenty-two German blind asylums on an average 30 per cent. blind from blennorrhœa; in the year 1896 in forty-five asylums only 10 per cent. (Hermann Cohn). The Credé prophylaxis prevents the disease immediately after birth. In the years from 1854 to 1866 no less than 1413 children were infected in the Vienna Foundling-House by blennorrhœa (E. Fuchs).

In the maternities of our country the Credé method was

introduced as a preventive soon as it was known, with the same results: in the great majority of cases no infected babies! This is owing to the *Credé* prophylaxis. I should also like to state that new-born children, with puriform conjunctivitis, are not all infected by gonorrhœa, but many have a catarrhal eye-disease, caused by leucorrhœa, from which so many women suffer. Their children have only a mild eye-catarrh, from which they recover quickly and without consequences. The *microscope* decides whether it is the bad or the mild affection, by the presence of the gonococcus or not. Dr. Neisser, now professor at the University of Breslau, Prussia, is the discoverer of the gonococcus and several other microbes.

Oculists meet with a good many children afflicted with infective conjunctivitis, but few of these come from the maternity-hospitals. Here there is room for a law: "to compel midwives and obstetricians to disinfect all babies' eyes as soon as they are born."

The Credé method, good as it is, has been perfected. The nitrate of silver which sometimes irritates the eyes of a baby is superseded by a group of new remedies, which are fully as active, and besides entirely painless and innocuous: *the organic silver-salts*. Instead of the nitric acid, these organic silver-salts are proteids of silver; among the most available of them are *protargol* and *argyrol*. I am conversant with the use of both.

As to the silver treatment, I think that nitrate of silver in a 1 per cent. solution or more, during the *acute stage* of infective purulent conjunctivitis, is wrong in babies and adults. Acute inflammation of the conjunctiva, in my opinion, requires antiphlogistic treatment: linen compresses, made cold on ice, should be used day and night until the height of the inflammation is over. The secretion must be dipped up with absorbent cotton or gauze, both sterilized. The *prophylaxis*, with 1 or 1½ per cent. silver, is excellent, but when several days are over I do not think that this is still the best treatment. If a baby has nitrate of silver instilled immediately after birth into the conjunctival sac, the germs, which are still on the surface, can be destroyed

by means of this remedy, but when they have entered through the thin epithelial cover the nitrate of silver irritates and does no good. The germs are then in the deeper, succulent layer, where they find the best soil to proliferate. The nitrate coagulates the albumin, which prevents its further access into the subepithelial layer, which is composed of fine capillaries and small round cells like the rete Malpighii in the skin. Nitrate of silver is, however, very effective in the later stage, when the fornix is full of pus-cells and the mucous membrane swollen, ragged, and granular, just as in trachoma.

At that day the nitrate-of-silver treatment should also be abandoned in favor of the organic silver-salts; for instance, protargol and argyrol in 5 to 25 per cent.; protargol is a little stronger and also a little painful. *These preparations do not coagulate albumin, but penetrate into the depth where they meet the gonococci.* These remedies are excellent for this destructive disease.

There are two kinds of **metastatic gonorrhoeic eye-disease**. The one is as an acute *iritis*, with a faint exudation in the anterior chamber, occurring mostly in connection with disease of the knee-joint or other joints. It is moderate in its symptoms, and lasts from four to six weeks. The treatment is that of the so-called rheumatic *iritis*: atropine, leeches to the temple, bed-rest, and evacuation of the bowels. I have rarely seen this variety, but the cases were well characterized.

The other variety is as infrequent. I see about three or four cases a year. I described it more than thirty years ago under the name of **spongy iritis**; about the same time it was described under the name of **gelatinous iritis**. It is an acute process; the anterior chamber is filled with a kind of gray fluffy exudation; the sight is very poor, but the disease, as far as I have seen it, was entirely recovered from with perfect restoration of good sight. The treatment is that of an acute *iritis*. The exudation is peculiar; it fills the anterior chamber completely. The diagnosis, when we have seen one case, is easy. In four to six days the exudation commonly begins to absorb on the upper part of the

chamber. The exudation shrinks, which makes it more compact (gelatinous), and on the first glance looks somewhat like a cataract dislocated in the anterior chamber. The diagnosis is easy; the condition, peculiar and deceptive at first, but in two or three days it will be evident by the absorption at the upper edge. The treatment is like that of an ordinary iritis, with alteratives additionally.

This kind of iritis occurs also in *syphilis*, and may come many years later than the primary disease, often to men apparently in good health. In this variety, not only is the anterior chamber affected, but the other chambers participate in the inflammation; the vitreous is quite dull, so that no fundus-picture can be seen. The patients, and frequently also their medical advisers, receive the impression that it is a very serious condition. This is not the case. I have seen about half a dozen cases, with invasion of all the cavities; ciliary congestion marked; no fundus reflex; tension normal; no particular pain. The cases I have seen, recovered, but it required at least six weeks in bed at the hospital under mercurial treatment.

There is also a *metastatic gonorrhæal conjunctivitis*. Of this kind I have seen only two or three cases; the intensity, while considerable, was not the same in degree as in the infective variety. There were gonococci in the conjunctiva, none in the urethra, and the primary affection had long disappeared. It is difficult to ascertain its real nature: there may have been a chronic gonorrhœic affection, with few cocci for a time, so that we thought the patient was cured; he may have had a small colony of slumbering cocci, which, by an unknown cause, came to wake again. I draw attention to such behavior by the so-called slumbering cells, that "sleep" for a time.

B.—THIS LEADS ME TO THE SYPHILITIC DISEASES.

I. *The primary hard sore* (chancre) has been found on the edges of the eyelids, for which the lips and finger-nails are responsible. The swelling and hardness are the first suspicious symptoms; after six weeks we notice the roseola and other characteristic symptoms. The affection is analo-

gous to chancre of the lips, of which I have seen a marked example in a house-keeper of a widower.

II. *Syphilitic Iritis*. This is not rare, and is easy to recognize by the little gummous nodules around the pupil, besides the ordinary other symptoms. Iritis is painful, especially at night. The prognosis is favorable. The treatment is bed-rest, atropine instillation, free catharsis, and, chiefly, mercurial inunction twice daily, until salivation. It may be so acute and vehement that we must administer mercurial treatment so vigorously that salivation is produced within twenty-four hours, otherwise the eyeball may be destroyed (v. Gräfe).

III. *Syphilitic Inflammation of the Ciliary Body*. This form is tedious and severe, but not incurable. It is often connected with syphilitic iritis. Under full mercurial treatment it may shrink and disappear. Sometimes it pierces the sclerotic near the cornea, in the upper ciliary area. The mercurial treatment has to be continued until the perforation is closed. I treated a young woman for this disease and she recovered very well, with preservation of good sight. She has had no relapse. A few cases of this kind are on record, (Ewetzky, Stieren; myself).

IV. *Syphilitic Choroiditis*. This form is mostly recognized by white, small, peripheric, round, disseminate patches, *i. e.*, defects in the periphery of the choroid. They are not characteristic; the diagnosis must be made by the course and the symptoms. Treatment: specifics—Hg and KI.

V. *Hereditary Syphilitic Keratitis, Interstitial or Parenchymatous*. This is a singular disease. The late Sir William Wilde, of Dublin, defined it as strumous or scrofulous; but it was reserved to Jonathan Hutchinson, of London, to discover the true cause. The cornea is dull, the upper incisor teeth are stunted, and concave on the lower edge. It occurs more frequently in girls than boys. The cornea is grayish, in small patches or diffuse, caused by an infiltration of the parenchyma in the deeper strata. It clears up slowly and incompletely. These diseases, iritis, cyclitis, and choroiditis, may occur single or combined; the keratitis adds itself to them, especially if they are hereditary. Sometimes one

child has one, and another child has the other of the group ; also one child may have some of the symptoms and another the more characteristic ones.

Example.—Once a lady came to me with a well-marked parenchymatous inflammation of the cornea ; she had no other symptoms of hereditary syphilis. She was about twenty years old and looked the picture of health. When she came to visit me again she was accompanied by her somewhat older sister. The latter was haggard, had a saddle nose, and the Hutchinson teeth. *Her eyes were healthy.*

VI. *Syphilitic Retinitis* is induced by choroiditis, but it is also primary, as diffuse or patchy opacities ; also white long-stretched exudations, one or several disk-diameters ; it is frequently combined with inflammation of the optic disk. Hg and KI have good effect on it.

VII. This combination, the *Syphilitic Neuro-Retinitis*, is the rule ; specific treatment is efficient, yet it will take months to restore a healthy ophthalmoscopic picture. The symptoms are swelling of the disk and the retina.

VIII. The *Muscles of the Eye* are frequently attacked by the syphilitic poison. The fundamental symptom is double vision, caused by a paralysis of one or several muscles. The paralysis is not a disease of the muscle, but of the nerve, which excites the muscle. The cause of these paralyzed nerves lies mostly in the brain ; rarely in the orbit. I cannot go deeply into this chapter, but the diagnosis, in general, is not difficult, and the treatment is internal. Hg and KI, if the disease is not too old, are efficient ; if it is of long standing, no treatment is likely to yield great results. Operations on the paralyzed muscles are not very satisfactory.

IX. *Tabs or Locomotor Ataxia.* Among the many diseases of syphilitic origin, let me finish this address with a reference to the one which causes the greatest misery.

“When you see an elderly man—women are almost exempt—walking with a cane, and with uncertain step, or led by a guide, it is likely he suffers from locomotor ataxia.” This disease, in my experience, is syphilitic in the greater

number. The eye-surgeon sees these sufferers more than the other physicians. Tabes mostly leads to blindness; the optic nerves dwindle away as the locomotor-nerves—the spinal. It is very chronic, and not a disease of the first half of life. The great majority of cases, I may say, are due to syphilis. About thirty-five years ago I examined every sufferer from tabes and noted the results. The percentage was over seventy-five. The first locomotor symptoms occur many years after the infection. Very many have forgotten it, and those cases where there was no great trouble were those that caused insidiously the late manifestations. I beg your pardon, if you will allow me to quote a pertinent example.

A wealthy and well-bred gentleman, an amateur painter, of about sixty years, came to me with manifest locomotor ataxia, complaining of loss of sight in both eyes. I examined him with the eye-mirror; the nerves were white (wasted). As he walked a little shaky, I examined his pupils. When I threw light on them: they remained immovable. When I told him to look at the opposite wall, they dilated. I told him I was sorry he had locomotor ataxia and that his optic nerves were weak. I asked him if he had never had a disease from a woman. "Oh, no!" he said. Then I asked him to think of former years.—"None, sir!" I told him to think again, a long time ago. Then his eyes looked treacherous, and he said: "Oh, yes! in Rome, more than thirty years ago, there was a model."—"Did you suffer much from the disease?"—"Oh, no! The doctor said it was nothing bad; only a chancroid." I told him "that was the origin of his disease; that specific remedies were now of no use, but he could keep himself as well as he was then; he might even grow stronger and see better if he were careful in his diet and have regular exercise. Make it a point to keep all the rules of health."

Syphilis is the chief cause of weakness of sight and atrophy of the optic nerves.

THE DEPENDENCE OF ACCOMMODATION AND MOTILITY ON THE REFRACTION OF THE EYE.¹

BY HERMAN KNAPP, M.D., NEW YORK.

THE live journal, *The Ophthalmoscope*, takes me to task by a short note, vol. iv., No. 2, p. 67.

C. Marcus quotes: "*Knapp*, in an article of the above title, published in the *Recueil des Travaux du X^e Congrès International d'Ophthalmologie*, Lucerne, September, 1904," and says as follows:

Knapp is in the habit of testing all hyperopic patients for esophoria by means of Stevens's phorometer. He thinks it possible to determine thereby not only the condition of the eye-muscles but also the degree of latent hypermetropia. He says that convex glasses neutralize the lateral displacement in the case of homonymous double-images, and so indicate the degree of latent hypermetropic refraction. This view can, however, not be accepted, for whatever effect convex glasses may have on the relative position of the images can only be due to their prismatic action, and not to any influence on the patient's accommodation.

C. MARCUS.

I see that the inductive philosophy (*i. e.*, to solve problems by pure thinking) is not dead yet, but has travelled from Germany to England, after having been killed in medical science by the physical school of Joh. Müller, Dubois-Reymond, Brücke, Ludwig, and particularly Helmholtz. Mr. Marcus might have easily found the truth by examining a few hyperopes in the way indicated. My contention

¹ Read before the British Medical Association at Toronto, Canada.

is as follows: We know by experience that the *emmetrope* sees perfectly at distance without an effort; his refraction gives him sharpness of retinal pictures and muscular balance at distance *without an effort*. Otherwise the *ametropes*!

The *hyperope* has to strain his ciliary muscles, even at distance, to see clearly. Without convex glasses he tires, which causes asthenopia and headache. The *myope* does not see clearly at distance without suitable concave glasses, which give him sharpness of sight and soon also muscular balance, just as the *emmetrope* and the *hyperope* with the neutralizing convex glasses. Near-sighted eyes have, as a rule, exophoria. A *hyperope* with $+2\text{ D}$ has to accommodate, *i. e.*, contract his ciliary muscle to the effect of $+2\text{ D}$ in order to look without a strain in vision at distance. *These two degrees of contraction by the ciliary muscle have been incited by a nerve-impulse of the same strength.* Now, as a nerve-impulse is sent into the muscles of accommodation, it will be sent also into the muscles of convergence, for both functions, accommodation and convergence, are effected by voluntary muscles which, as equal partners, receive the same impulses. When we disrupt the convergence with a vertical prism, the hyperopia remains, and the convergence can be measured by Maddox glass-rods or Stevens's phorometer; as a result we find that this patient has also about two degrees of esophoria. When now, as a counter-test, we hold a $+2\text{ D}$ spectacle-glass before the patient's eyes, the *hyperope* of $+2\text{ D}$ sees clearly without an accommodative effort, and the esophoria is wanting, but it reappears when the plus glass is removed. This seems that the same nerve-impulse was sent into the internal recti as well as into the ciliary muscles.

In *myopic* eyes the conditions are the same in character, but with negative glasses. Let a *myope* of -2 D look at the distance, then through the phorometer, he will show two degrees of exophoria, or near that. In my experience the *myopes* do not give so uniform results as the *hyperopes*. I mean the exophoria is not so even with the *myopia* as the esophoria with the *hyperopia*. With the *hyperopes* it is almost a physico-mathematical problem; and this class

benefits much more than the myopes. The combined testing of motility and refraction is a comfort to the patient and time-saving to the oculist, particularly if he has to deal with latent hyperopia.

This chapter has still some problems to solve. One is that the patient has what we may call an "educated" ametropia, which is identical with Donders's manifest H and M. With $+$ or $-$ glasses we first try to get the best correction, then we test the patient with the phorometer, and obtain a near approach to the absolute H or M. For treatment we prescribe the glasses which the patient accepts, namely, the manifest ametropia. This educated condition is sometimes surprising. For example, a man of about thirty had two degrees of hyperopia; with the phorometer I got four degrees esophoria. He was quite satisfied with his $+2$ D for all purposes. Nevertheless, I told him to come back in six weeks for a stronger and better glass, which he at first did not tolerate. In myopes the same.

With regard to treatment, I want to add a few observations which I have made.

Not quite rarely I find patients, chiefly delicate young ladies, whose eye-ground shows nothing abnormal, and they wear negative glasses. As they have asthenopia and headache, I try them with $+$ glasses, which they reject. Then I examine them with the phorometer; they do not show esophoria, but a less degree of M. Now I give them $+0.25$, first for reading, then for distance, and I give them $+0.5$ to read with, and in four or six weeks to use $+0.5$ for distance and $+0.75$ near, thus to gradually come to the total hyperopia. In those cases their accustomed distance-glasses are much too weak. Every now and then we have to find out the real far-glass with atropine in full strength, f. i. in strabismus. If the manifest ametropia, when corrected, does not relieve the asthenopia, I try the ametropia under atropin.

Furthermore, I like to say that *$+$ glasses may do harm if they are too strong.* Not very long ago an oculist of St. Louis wrote me: "Whether I remembered a certain squint-boy whom I had treated; he had been straight for some

years, but now he had a steady divergence. He was wearing + glasses, but he had not been operated on by me or by anybody." Strange, the well-known duplicateness of rare cases! Since that time I have seen three hyperopes that wore convex glasses and had divergent squint. The cure was simple. I found that the glasses were too strong. Whether they were too strong when I prescribed them, or whether the hyperopia had diminished, is a question. There is a large group that can be made comfortable with glasses. I make tenotomies not so frequently as I used to do, but giving them all up would be going too far. Insufficiency, *i. e.*, heterophoria, requires it exceptionally, and strabismus also—that is, when the long contraction has made the muscle rigid; a tenotomy to turn the eye so much that the glasses are efficient enough to straighten it. A tenotomy of the rigid muscle, combined with advancement of the antagonist, gives, as a rule, the best results. Near-sighted people require greater examination and care, for their error of refraction is complicated with organic disease—the crescentic choroidal atrophy at the temporal margin of the papilla. The *treatment rests, besides the organic changes, on the acuteness of sight and the motor anomaly*. Mostly there is more or less exophoria. The principle of treatment is to re-establish orthophoria by weak, gradually increasing glasses. It is important to avoid all overwork, enforce proper arrangements for reading and writing, sufficient rest, and observation of the rules of general hygiene in all cases. Successive increase of the strength by weakest addition, — 0.25 after six weeks or two months, and then go on with the additions, — 0.25 or stronger, if tolerated. I have seen good results in myopia and exophoria by this method of treatment.

I think that I have brought sufficient proof that the combined action of muscles of accommodation and the internal recti are excited by one nerve-impulse. *Ful. v. Michel*, professor of ophthalmology in the *University of Berlin*, has expressed the same opinion. Another proof of this connection of two muscles acting for one purpose is the contraction of the pupils and the convergence of the eyes;

which adorns the name of *Argyll Robertson, of Edinburgh*. Another conclusive demonstration of our connection with accommodation and convergence has lately been communicated (July, 1906) to the Ophthalmological Section of the American Medical Association at Boston by Dr. *S. H. Savage, of Nashville, Tenn.*, viz.: If you dilate both pupils with atropine, the pupils are dilated and the accommodation is paralyzed, but not the convergence.

All these experiments have a great importance in science and practice: scientifically that a function for one purpose may be executed by different muscles, which are under nerve-impulses to the same degree under the exigency of the function. Our example has the remarkable condition that we can by measuring the strength of one determine also the other. Practically it has showed that the heterophorias are not insufficiencies, and that the treatment lies in the spectacle-case and rarely only in the operative box.

SUDDEN BLINDNESS FOLLOWING SUPPURATIVE CONDITIONS ABOUT THE EYEBALL.

By ARNOLD KNAPP, M.D.

SIGHT is occasionally suddenly lost when there is an acute suppurative process in the neighborhood of the orbit. The orbital symptoms are those of a cellulitis of a varying intensity. The ophthalmoscopic picture is that of an embolism of the central retinal artery with consecutive optic atrophy and obliteration of the arteries.

The following cases are illustrative :

CASE 1. *Blindness following an operation for empyema of the frontal sinus.*—The patient, fifty years old, had had five attacks of manifest empyema of the right frontal sinus, following the gripe, in five months. When seen, the upper eyelid was swollen and oedematous, the lower part of the frontal sinus was enlarged, and the bony walls were very tender. Eye normal. Nose: anterior extremity right middle turbinal hypertrophied and bathed in pus. The anterior extremity of the middle turbinal was removed, and two days later the sinus was operated on according to Kuhnt's method; the entire anterior and inferior wall removed. A perforation existed at inner third of junction of anterior and inferior walls. The ethmoid cells seemed normal, and only the infundibular cells were eradicated in making a broad communication with the nose. The periosteum of the orbit lining the inferior wall was found very much thickened and inflamed. The anterior wall was restored by uniting the periosteocutaneous flaps; the lower was left open to admit the packing. On the following day she had some pain. Temperature, 100° F. On second day dressing was changed; some oedema of upper lid and slight exophthalmos. Wound clean; on raising lid, patient exclaimed that she could not see. The pupil was fixed and semi-

dilated ; the ophthalmoscope revealed a condition similar to an embolic process ; the retina was hazy and œdematous ; arteries very small, and at one point the inferior temporal artery appeared obliterated ; no swelling of the disk. Three small hemorrhages were about the macula. The œdema of the retina gradually disappeared, the hemorrhages were absorbed, the disk went on to simple atrophy, and the patient remained blind. The frontal sinus wound did perfectly well and healed promptly with no deformity.

CASE 2. *Blindness following periostitis of the superior maxilla of dental origin.*—On November 26th, L. G., sixteen years old, had the right canine and second incisor teeth filled at line of gum ; on the third day after had some toothache ; the right half of the face began to swell and the right eye was closed. Five days later the gum in front of the canine tooth opened and discharged pus. The swelling of the face diminished and the eye opened after having been closed for a week. The patient immediately noticed that she could not see with that eye. She came to the dispensary on December 17th, three weeks after the tooth had been filled. The pupil was dilated and immobile. The optic nerve was white ; the vessels were normal ; slight atrophy of the choroid about the disk. The anterior surface of the superior maxilla was swollen and tender. In the floor of the orbit there was a firm, resisting, flat swelling. A fistula discharging pus was situated in the canine fossa ; a probe could be passed upward and forward under the periosteum and rough bone detected. The mucous lining of the outer wall of the inferior nasal meatus was swollen ; aspiratory puncture of the antrum of Highmore was negative. In the subsequent course the eye has remained blind ; the disk is white ; some of the arteries, especially near the disk, can hardly be recognized. The swelling in the floor of the orbit remains ; the discharge from the fistula has almost ceased.

CASE 3. *Blindness from penetrating wound of orbit with cellulitis.*—E. B. January 12, 1904. Four weeks ago lead pencil injured right orbit, entering outer half of lower lid. Orbital abscess developed. This was opened two weeks ago and pus evacuated. Now marked exophthalmos up and out. Lids hard and swollen. Chemosis. Disk white. Arteries very small, V = o.

The ophthalmoscopic picture in these cases differs from that of the common occlusion of the artery from thrombosis or embolism, in that the whitish haze of the retina and disk is more marked, and that the subsequent transformation of the arteries into white lines is more constant.

What pathological process in the orbit can produce this picture?

A direct involvement of the optic nerve should give the evidence of an optic neuritis with hemorrhages and exudates, as we see in the usual orbital complications after suppuration of the accessory nasal sinuses.

It might be supposed that the inflammation of the periosteum extends to the apex of the orbit, and there compresses the optic nerve, but, though blindness would result, there would be no ophthalmoscopic evidences at so early a stage.

An involvement of the orbital veins, thrombo-phlebitis, with extension to eye, gives an entirely different ophthalmoscopic picture.

The ophthalmoscopic picture seems to prove an involvement of the arteries; this could be explained by an inflammation of the central retinal artery, an acute arteritis.¹ Without an anatomic examination this question cannot be decided. The process in the artery is sufficient to not only shut off the blood current, but subsequently leads to a proliferation of the empty arteries, as is shown by the white glistening lines, which are not present or not so marked in the picture of the non-infectious embolism of thrombosis of the retinal artery.

Michel,² states that acute periarteritis and periphlebitis have been observed in facial erysipelas with preceding involvement of the orbit (exophthalmos). Ophthalmoscopically there is at first a diffuse white cloudiness and swelling of the disk and retina, the arteries subsequently become converted into white glistening lines, the disk turns white, and the eye remains blind. This coincides with the picture observed in the above cases.

¹ Ziegler, *Pathologische Anatomie*, vol. i pp. 60-63, 1903.

² *Klinischer Leitfaden der Augenheilkunde*. 1903.

DOUBLE CONGENITAL ANIRIDIA WITH GLAUCOMA AND CATARACT. EXTRACTION WITH RESULTING GOOD VISION. OBSERVATIONS ON THE ACTION OF ESERIN WHERE THE IRIS IS ABSENT.

BY DR. DAVID N. DENNIS, OF ERIE, PA.

CONGENITAL aniridia is a comparatively rare condition, especially when associated with cataract. The case reported below is one of total absence of the iris and ciliary bodies. It is stated by some authorities that the usual glaucoma found in congenital aniridia is from the pushing forward of the rudimentary iris into the ciliary angle, thus obstructing drainage. I think that this can be safely excluded in this case, as the most searching examination failed to show a vestige of the iris or ciliary process.

George B., aged twenty-three, a farmer by occupation, first consulted me on November 9, 1901, and gave the following history: His general health had always been good. He always had difficulty in seeing—in fact, he never remembers seeing with his right eye, but always with the left—at least, enough to get the rudiments of an English education. The family history gives nothing in the way of eye trouble other than the total blindness of the father. The grandparents, brothers, and sisters had good vision. I had an opportunity of examining the father, and found phthisis bulbi present in both eyes. He gave a history of perfect vision as a young man. He had no difficulty in reading or seeing to do his work. He seemed to be somewhat doubtful as to the cause of his loss of sight. From the appearance it would seem to be a case of septic choroiditis, possibly from an injury, although this could not be elicited. The son's

vision at the time of first examination was equal to the counting of fingers at six inches in left eye ; a mere light perception in the right eye, with a pronounced nystagmus of both eyes. Tension of right eye + 2, left eye + 1. Cornea clear in left eye, slightly cloudy in right, with a total absence of iris and ciliary bodies in both eyes. Lens of right eye totally opaque. In the area of the suspensory ligaments a red reflex could be obtained by reflected light. In the left eye a partially mature cataract was present. No view could be obtained of the deep eye. Light projection was apparently perfect in the left eye, but very questionable in the right. Patient sent to the hospital for operation. On July 10, 1902, the cataract was extracted from the left eye with no loss of vitreous. Smooth recovery. There was present a moderately thick secondary membrane. For two weeks following operation the tension of the eye was normal. After this a noticeable plus tension was again present. The use of eserine twice a day brought the tension down to normal. On August 2, 1902, the secondary membrane was divided. The recovery from this was smooth, with no unusual increase of tension, although when the eserine was discontinued for any length of time a noticeable plus tension commenced. With a spherical + 14, vision = 6/60. Eye-ground perfectly normal. The nystagmus, which was not modified by the operation, made it of course impossible to get a higher percentage of vision. As far as it was possible to determine with the constant oscillation of the eyeball, the field of vision was normal. Patient was seen again on September 22, 1902, eserine having been used in the meantime twice a day. The tension at that time was found to be normal, and the eye perfectly quiet. Vision remained 6/60. Patient was able to take care of himself, do his work, and read No. 6 Snellen with a spherical + 16. The eserine was discontinued. Patient was again seen May 13, 1904. Tension normal. Field of vision remaining about the same as when first taken. He was then instructed to use the eserine every second or third day. Patient was again seen on May 29, 1906. Vision at this time with glasses 6/60. Nystagmus still present, although less noticeable than at first. The amount of vision has noticeably increased in modified light, although he has some difficulty in seeing in the strong sunlight. This is natural, as the absence of the iris deprives him of the power of modifying the quantity of light. The opening made through the capsule remains free. Tension of

left eye normal ; right eye + 1, with some haziness of the cornea. Patient is able to read ordinary print in proper light, although close work has been restricted, as a precautionary measure. He has no trouble in attending to his work, and suffers no pain.

The length of time that has elapsed since the tension was last noticed would lead one to suppose that the danger of glaucoma had passed. One of the most interesting features of this case is the action of the eserin in reducing the tension. It is usually thought that the lowering of the eye tension by the use of eserin is produced by the myosis. In this case, where the iris and ciliary bodies are absent, it shows that the lowering of the tension is produced by some other cause than its action on the iris. This fact I was able to prove on various occasions, when by stopping the eserin for a day or two there would be an invariable rise in tension. This fact, I find, is mentioned by Noé Scalinci in *Annali di Ottalmologia*, Fasc. 7, 8, 9, 1904, and reported in *Annals of Ophthalmology*. He reports a case of congenital bilateral aniridia, where there was increased tension that was perfectly controlled by instillations of eserin. The action of eserin in lowering ocular tension must be from its well-known power to contract the blood-vessels, as well as its action in contracting the pupil.

It is thought by many that aniridia is hereditary. Dr. Mossenier reports several cases in one family. There is no evidence of this being so in the case just reported. The general appearance of the patient is one of premature senility. He has the appearance of a man of forty rather than twenty-three. His mentality is rather dull, although far from that of an imbecile, as the case reported by Dr. Mossenier. The dulness may have been from the restricted life he was compelled to lead rather than from a natural lack of development. The production of glaucoma by some authorities is supposed to be from a blocking of the ciliary angle. Treacher Collins, in his article on glaucoma, states that there is predisposition to glaucoma in many cases of aniridia. Strands of tissue are found stretching from the rudimentary iris to the ligamentum pectinatum. If this be

so in the above reported case, it is rather hard to give an explanation of the total subsidence of the tension after using the eserine. The circulation of the eye must have been influenced in some way so that the drainage was thoroughly balanced. That this was regulated I think can be fully proved from the length of time which had elapsed from the date of operation to that of last examination.

A RARE PATH OF INFECTION OF AN ORBITAL ABSCESS.

BY DR. C. BARCK, ST. LOUIS.

(With two figures on Text-Plate XV.)

On the 3d of May, 1906, W. G., a boy eight years of age, was hit on his right temple by a stone, thrown by another boy. Two days later high fever set in; on the third day the upper lid commenced to swell, and on the next he was unable to open the eye. Then the family physician, Dr. K., was called in. He found a temperature of 104° F. and the patient somewhat comatose and delirious; these symptoms increased during the following days and he asked for a consultation.

I saw the patient on the 8th. There was a small, irregular wound on the temple, about one inch above the outer end of the supraorbital margin; it was not much more than *2mm* long and looked as if made by a sharp-pointed instrument. It contained some discolored purulent secretion. The probe went down directly to the bone, some roughness being felt, giving the impression of a fracture. The upper lid of the eye was enormously swollen, red, and œdematous. The patient was unable to raise it. When opened artificially, exophthalmos of considerable degree was found, the eye protruding straightforward. Examination of the fundus was impossible, as the patient was in a half comatose condition. Temperature 104.5° . Complains of severe pain in eye and head.

The diagnosis which seemed the most probable was that of an orbital abscess, with the supposition that the infection had spread from the wound around the orbital margin and reached the orbital contents. But, on account of the benumbed sensorium and the delirious condition, the possibility of an infective thrombosis of the cavernous sinus and ophthalmic vein was also taken into consideration. The cavernous sinus may have been reached

through one of the diploic veins of the supposed fractured bone or by way of a meningitic process. In adherence to the former view, it was decided to explore the orbit.

Operation next day in hospital, in narcosis. I had decided not to make the usual incision, but to follow the supposed path of infection from the wound. Therefore a section was made from the wound vertically downward to the edge of the supra-orbital margin, to the bone. To our astonishment we found that the roughness felt with the probe was not due to a fracture of the bone, but simply the edge of a large emissarium. The surface of the bone in the entire length of the cut was perfectly normal. From the lower end of this section I then went into the orbit with a small bistoury in different directions as far as one inch and at least a dozen times, and afterwards with a probe, without evacuating pus. A drain was introduced. Patient passed a fairly good night; the temperature fell to 102° . The exophthalmos and the swelling of the upper lid had rather somewhat increased. But the following day the dressings were saturated with pus and the exophthalmos had considerably subsided, showing that the abscess had emptied. Cases of this kind, where the orbital abscess is not found at once, but opens some time later, are quite frequently reported in literature.

The facts, that we found an emissarium instead of a supposed fracture of the bone, and that the tissues of the assumed path of infection were found perfectly healthy, induced me to examine a number of skulls. There is normally an emissarium present at this place, sometimes quite large, as shown in Fig. 1. The location differs somewhat, being situated in some instances directly upon the linea semicircularis of the frontal bone, in others nasally to it. It lies between 15 and 25 mm. above the outer edge of the supraorbital margin. This emissarium is not mentioned in the current text-books of anatomy. Gray, Morris, and Quain name in the anterior portion of the skull only two emissaria; the "frontal," at the supraorbital notch, and the aperture in the great wing of the sphenoidal bone, which Gray and Quain term the "anterior temporal," Morris the "fronto-sphenoidal." The unnamed one is just as large as the others, and certainly more important from a surgical standpoint, because it is much more exposed to injuries and consequent possible infection. From the aperture the canal leads downward into the diploë. In the elongation of this direction we find that the outer portion of

Illustrating Dr. Barck's article on "A Rare Path of Infection of an Orbital Abscess."



FIG. 1. Showing emissarium



FIG. 2. Foramina in outer-upper wall of orbit.

the roof of the orbit, in the so-called lachrymal fossa, is perforated by a number (about a dozen) of small foramina, as seen in Fig. 2 (Pictures taken from the same side of one of my skulls.) It now became apparent that this must have been the path of infection from the emissarium into the diploë, thence through these foramina into the orbital tissue. The subsequent course confirmed this opinion. It was as follows :

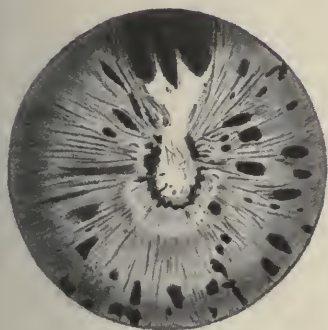
The swelling of the lid and the exophthalmos receded rapidly under free drainage, and had disappeared entirely on the 17th. The drain was then left off and the orbital portion of the wound was closed on the 18th. The comatose condition had likewise disappeared. But the temperature did not return to the normal. It ranged between 102° and 103.3° and the patient was very weak and emaciated. The vertical portion of the wound upon the frontal bone was suppurating all the time, and I found the mentioned canal, leading downward from the emissarium, regularly filled with pus. I cleaned it well, partly with the syringe, partly with a fine wire dipped in an antiseptic solution. When the temperature did not decrease after the healing of the orbital abscess, I concluded that there must be an infective focus in the diploë left, and intended to chisel this part open, if the temperature should continue or other unpleasant symptoms should develop. But on the 20th the fever commenced to decline and the temperature returned to the normal on the 22d and remained so. The minute canal as well as the wound became covered with healthy granulations, and commenced to fill up. Patient was dismissed from the hospital on the 29th of May. The exophthalmos had disappeared; the upper lid could be raised to about half of the normal degree. The vision was fairly good on a superficial test; a more exact one and fundus examination were deferred. On account of very flabby granulations the wound closed slowly and was cicatrized fully on the 20th of July.

After leaving the hospital, patient was under the care of his family physician. On the 6th of June he was examined at the office and the fundus found normal. Vision = $\frac{5}{7}$; reads Sn. I. Position and movements of the eye in all directions normal. The next time he was seen was on the 10th of July. He had had high fever during the preceding week, and had been compelled to stay in bed for some days. There was severe headache; his neck had been stiff and contracted, so that the family

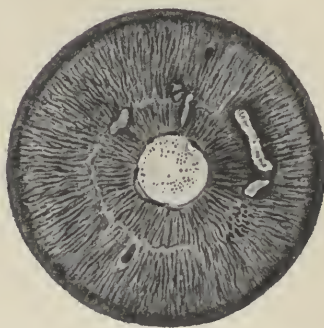
physician diagnosed a beginning cerebro-spinal meningitis. But these symptoms disappeared soon. When seen, there was convergent strabismus. The first impression naturally suggested, that the paralysis was of orbital origin, a sequel of the abscess and the operation, but a closer examination revealed that there existed a paresis of the external rectus of each eye of about the same degree. These could only be of intracranial origin, and the diagnosis of a slight meningitis as a late sequence of the infection was confirmed. Under the administration of iodide of potassium these pareses disappeared entirely and the patient recovered fully. When seen last, the movements of both eyes were normal; fundus of right eye normal; $V = \frac{3}{4}$; Sn. I.

Evidently the diploë in the frontal bone was the primarily infected focus, which led first to an infection of the orbital tissue and later on to a happily benign meningitis; whether the latter might have been prevented by the intended chiselling open of the focus, is an open question.

1.



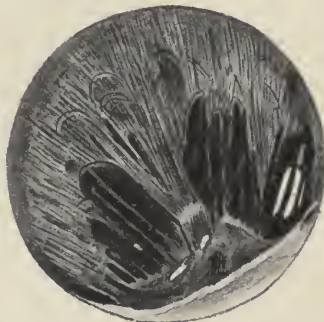
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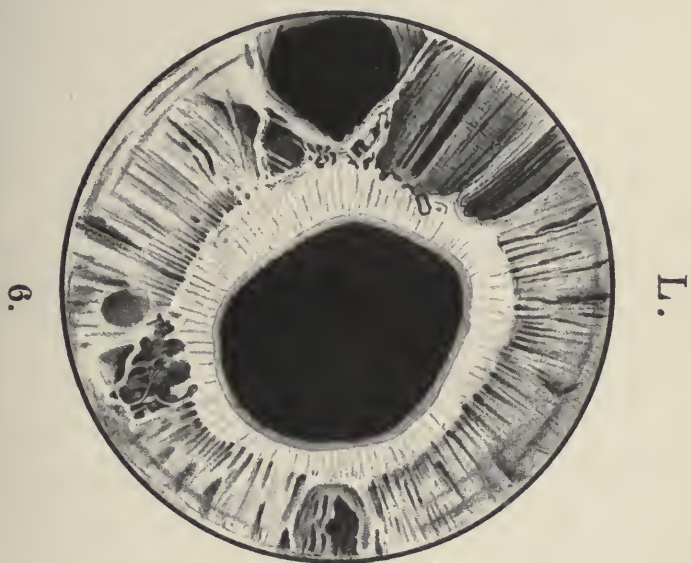
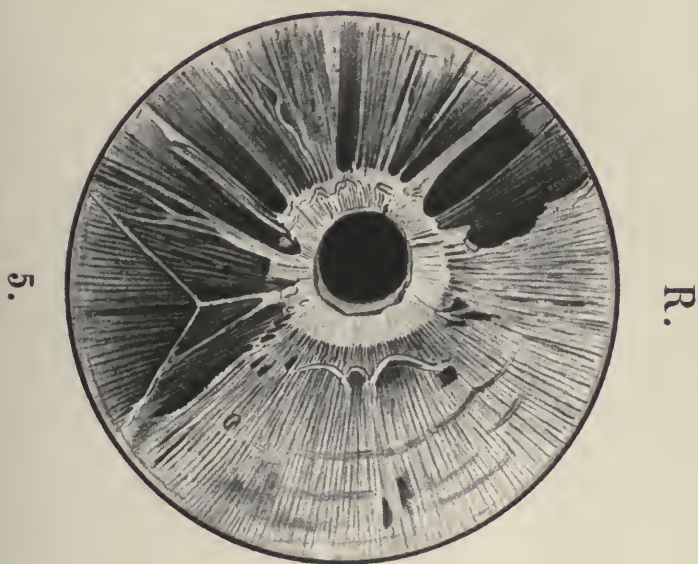


3.



4.





CLINICAL CONTRIBUTIONS TO THE STUDY OF ATROPHY OF THE IRIS.

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(With six figures on Plates VI-VII.)

IN the following cases, observed during my service under Prof. Eversbusch and reported at his kind suggestion, we have to deal with circumscribed loss of tissue in the iris, presenting itself in the form of more or less extensive defects or apertures, and due to circulatory disturbances. Such tissue changes, which are in the last analysis of a purely mechanical nature, must be regarded as due to abnormal conditions of tension and pressure in the coats of the iris, caused either by pathologic fixation and exudation following inflammatory processes, or by increased intraocular pressure of glaucoma.

CASE 1.—Maria M., aged forty-six, came to the clinic on October 18, 1901, for treatment of an injury to the right eye, which had been struck, a few days previously, by the horn of a goat. As a child she had had repeated attacks of inflammation of the eyes, and had always seen badly. Present condition: V O D, fingers "point blank"; V O S, 5/25, without correction. There are numerous corneal opacities, both diffuse and punctate, in both eyes. In the right there is a fresh and slightly infiltrated ulceration on an old macula. After this had been healed the patient's eyes showed the following condition in March, 1902:

O D: The corneal maculæ are vascularized particularly at the upper and nasal part. A number of punctate opacities are seen in the lens. The pupil is round and reacts promptly; there are a number of posterior synechiæ. The details of the iris are very indistinct, and the iris itself riddled with small round or oval holes of about pin-head size, situated to the outer side of the minor circle, in the middle, and at the periphery. Through some of these defects a red fundus-reflex is obtained on ophthalmoscopic examination. The cornea of the left eye is more diffusely opaque, and is traversed by numerous fine vascular twigs, many of which are obliterated. The pupil is drawn out of place, almost triangular, does not react, and is attached at several points of the margin to the anterior lens-capsule. At the bottom of the rather deep anterior chamber a number of small black spots are seen. The details of the iris are indistinct and its tissue felty and matted, so that no ridges or differences of level are seen on the anterior surface. The pupillary portion of the iris is differentiated from the ciliary by a somewhat darker brown coloring. A few darker spots in the stroma are found when magnified to be nævi, or, in some instances, circumscribed defects in the stroma, through which the pigment-layer shows. Most of these spots are found in the ciliary portion of the iris.

CASE 2.—L. Br., age fifty, formerly a house-keeper, suffered in 1896 with a severe iritis of both eyes, resulting in almost complete blindness of the left eye, in spite of early iridectomy, while the right retained somewhat better vision. In September, 1901, on admission there was only perception of light in the right eye, with doubtful projection in the left. Both eyes showed the residua of an irido-cyclitis, annular synechiæ, membranous exudation on the anterior surface of the lens, and atrophy of the iris. Both lenses were completely opaque. Nothing could be seen of the interior of the eye. Intraocular tension was reduced in the left eye, but increased in the right, requiring an iridectomy.

After an uneventful recovery from the operation, the patient was discharged, and in March, 1902, presented the following condition: Both eyes are free from irritation; the left deviates outward. O D: The cornea is clear except for a few punctate opacities on the posterior surface and in the parenchyma. In one or two places adhesions of the iris with the cornea in the form of iris-threads are seen. The anterior chamber is very

shallow, particularly at the middle. The iris as a whole is atrophic, green-gray, tense, consisting of tightly-stretched radial fibres, which at some points are unusually thin, allowing the pigment-layer to appear. Where this also is atrophic, particularly within the smaller circle of the iris, the yellowish white of the opaque lens can be seen through the defects in the tissue of the iris. These perforations are round or oval or long and polygonal. There is a coloboma of the iris upward. The pupillary margin is thin, jagged, and attached throughout its entire extent to the lens. The latter is entirely opaque, and cannot be transilluminated.

O S (see Fig. 1): The condition of cornea and iris is about the same as that of the right eye. Within the coloboma upward opaque white angular streaks and numerous fine deposits of pigment are seen on the surface of the completely opaque lens. The adherent pupillary margin is partially defective. The iris itself appears, on examination with the naked eye, to be studded with numerous gray and grayish-yellow dots, especially above and to the temporal side. Under the corneal microscope these dots are seen to be defects in the iris tissue, partly limited to the superficial layers, partly involving the entire thickness of the iris, so that the lens appears as a yellow background in the apertures. They are sharply defined, as if punched out, and show a red reflex when focal illumination is thrown on the sclera or the eye transilluminated from in front. In the illustration, which shows the conditions as seen in diffuse light, the defects are reproduced in uniform black. It is noticeable that they lie between the fibres of the iris and are arranged with the long diameter extending radially. The lens is opaque; the fundus cannot be seen.

CASE 3 (see Fig. 2).—The patient, a boy of ten, had had a severe irido-cyclitis a few years before, which had led to the loss of the sight of one eye. The left eye, which is now free from all signs of irritation, and not phthisical, shows the following condition:

The cornea is clear except at the periphery, where there is a slight clouding. The anterior chamber is of about normal depth; the iris is brown, lack-lustre, and of irregular structure. At the temporal side of the ciliary border of the iris, almost hidden by the corneal margin, several very small holes are seen in the

anterior layer of the iris, through which the pigment-layer is visible, so that at these points dark square areas appear, which are not seen in the illustration on account of their peripheral location. At the border of this atrophic zone, corresponding about to the region between the periphery of the iris and the smaller circle, there is an attachment to the lens, so that the anterior chamber becomes deeper at this point.

Along the smaller circle, reaching somewhat higher up than the peripheral atrophy, there is a series of atrophic spots arranged parallel to the pupillary margin, the lower ones involving only the anterior layer, while farther up the atrophy has affected both coats of the iris, so that complete apertures are found in which brownish-black spots are seen, as well as opacities like crystals in the much shrunken lens. Of the two defects at this point the upper is oblong, and adherent throughout its entire margin with the lens; the lower, diamond-shaped, and separated from the former by a bridge of delicate iris-tissue. Neither aperture shows the slightest trace of motion at its margin in unison with the play of the pupil. The latter is rather contracted and entirely occluded by the opaque lens, on the surface of which there are membranous deposits and a small circle of dotted pigment. The pupillary margin, when reacting consensually, shows a fairly good and regular motility, which, however, is soon lost as we approach the defects described above. There is no retraction of the pupillary margin toward these apertures. There is another small patch of atrophy in the upper nasal quadrant of the iris, limited to a small area and to the anterior layer. The eye cannot be transilluminated at any point and is completely amaurotic.

In the cases described above we have to deal with an actual loss of tissue, so that at some points there are holes in the iris, through which the opaque lens can be seen, while at others the atrophy is limited for the time being to the anterior layer of the iris, so that the still intact pigment-layer appears.

In all the cases reported, the atrophy was the result of a severe irido-cyclitis, which led to broad and firm adhesions of the iris to the lens. After iritic processes of not more than usual severity, the inflammatory tissue-changes generally disappear more or less completely, or, at most, leave behind a slight atrophy. This regeneration is made possible,

where there are no extensive adhesions to the anterior lens-surface, by the re-establishment of a normal blood- and lymph-supply to the tissue after the subsidence of the inflammation. If this return to the circulatory norm be interfered with, we may expect permanent tissue-changes proportionate to the extent of the adhesion. The sluggish absorption of iritic deposits interferes with the supply of nutritive material as well as with the drainage of effete tissue-fluid; all of which has a bad effect on the regeneration of this delicate membrane. A further injurious factor is that of mechanical traction, which is inevitable in case of marked adhesions. The usual pupillary oscillations are prevented by the synechiæ, causing a constant drag on the tissues, and still further favoring the development of nutritional disturbances. To all this there may be added the development of glaucomatous tension. The more marked the adhesions between lens and iris, the more surely will these various agencies be free to exert their pernicious influence.

As to the manner in which punched-out defects are formed, no clue is given by the observation of the cases recorded above. We probably have to consider the defects involving the anterior layer alone as precursors of complete perforative atrophy, for where both layers are involved we find entire correspondence of the defects in the two coats, so that a certain interdependence of the atrophic process in the anterior and posterior layer must be assumed. This would also be in accord with the anatomical arrangement of the iris-vessels, as the nutrition of the pigment-layer also depends partly upon the vessels of the iris, and any disturbance of circulation must likewise affect the nutrition of the deeper layers. This disturbance is intensified by an intimate adhesion of the pigment-epithelium layer to the anterior surface of the lens, which alone is sufficient to obstruct the processes of imbibition in the pigment epithelium. The form of the defects varies greatly. In one case, the defects were like narrow radial fissures; in the second, they were concentric with the pupil. This might be explained by differences in the degree of firmness or in the extent of the adhesions. As to the

location of the openings, it can only be said that it was impossible to determine a predisposition of any particular part of the iris. The crypts of the anterior surface do not seem any more disposed to the formation of atrophic perforations than any other parts. The observation of irido-dialysis in consequence of posterior synechiæ (Talko, Franke, Wecker) agrees with the well-known fact that the ciliary attachment of the iris is uncommonly delicate and loose. At this point destruction of the tissue by atrophy would take place most easily. It is true that such peripheral separations are not quite analogous with the defects described above, as the mechanical factor of traction plays a much more active rôle. Finally it is of interest to note that in not a few cases the atrophy at first affects the pigment-layer chiefly and spares the anterior layer for the time, so that the pigment epithelium may entirely disappear, while the atrophic anterior layer still remains as a distinctly visible membrane. This brings about the pictures in which, under focal illumination, the opaque lens appears as a yellowish-gray background to the circumscribed defect in the pigment-layer, being dimly seen through the translucent anterior layer. Such atrophies of the posterior layer seem to originate preferably in the region of the sphincter.

Whereas we have had to deal, in the cases thus far described, with atrophies occurring on an inflammatory basis, and due mainly to nutritional disturbances of particular portions of the iris, probably those implicated in posterior synechiæ, we shall now present a number of observations in which the etiologic factor of the loss of tissue was more purely mechanical.

CASE 4.—Clara S., aged eleven, school-girl, came to the clinic in January, 1902, on account of defective sight. The mother states that the child had had a corneal ulcer in infancy. On examination, both eyes are found to be free from irritation. In the left eye there are old diffuse maculæ and marked irregular astigmatism (see Fig. 3). In the right eye there is a nearly central leucoma about the size of the head of a match, which forms the most prominent part of the slightly staphylomatous cornea. The periphery is slightly cloudy, and the central opacity is

gradually lost in the clear cornea. It is vascularized by a few vessels running in from the limbus. The iris is adherent to this leucoma in such a way that the sphincter is almost completely free, while a point on the temporal side near the margin of the somewhat eccentric pupil has become attached to the leucoma. Above and below, the iris is well preserved, and runs in an inclined plane from the periphery to the point at which it is attached to the posterior surface of the cornea, but in the temporal portion there is an approximately triangular area of distinct atrophy. The apex is directed toward the leucoma; the base runs parallel to the corneal margin. This area is divided by a ridge of preserved iris-tissue (anterior layer) into two almost equal halves, in which the anterior layer is entirely gone. In the vicinity of the angle of the anterior chamber alone there are a few small remnants of the attachment of the iris. Between the spaces which have been formed in this way and lying upon the anterior layer of the iris, which at this point is tightly stretched, the brown pigment layer appears at a deeper level arranged in rather broad bands, and also traversed by fissures which run in a horizontal direction. Through the latter the fundus can be clearly seen on transillumination. The corneal microscope shows a distinct radial striation of the pigment layer which is slightly separated from the anterior layer, and, like the latter, tightly stretched. Under homatropin the pupil dilates but slightly on account of its partial fixation, without causing any slackening of the ridges of the temporal portion or wrinkling of the pigment layer. There is no monocular diplopia; and the patient cannot see through the secondary aperture when the pupil is covered.

CASE 5.—Paula H., aged fourteen, school-girl, was struck in the right eye with a gun-wad in December, 1900. On admission, on the day of the injury, there was a jagged wound in the cornea about 4mm long, running from the upper temporal to the lower nasal quadrant. The anterior chamber was partially abolished; the blood-stained iris lay against the posterior surface of the corneal wound. The pupil was oval and drawn toward the wound. Swollen lens-masses were seen in the pupillary area which could not be transilluminated. Good projection. The injury gradually healed, the lens becoming entirely cataractous. A year later the eye was slightly divergent, and there was a broad anterior synechia below and to the temporal side of the pupil,

which was also attached by its temporal margin to the corneal cicatrix. The pupillary margin was adherent throughout almost its entire extent with the cataract, so that there was only partial dilatation after instillation of a mydriatic. The iris-strands which were adherent to the scar appeared as a tough, uniformly cicatricial tissue drawn strongly toward the pupil. At the ciliary border, corresponding to the point of greatest traction by the synechia, almost entirely in the iris-angle, three small triangular openings are seen in the iris-tissue, separated by a strand running to the corneal scar. These defects are quite small. They are black, and are due to complete loss of the anterior layer of the iris at these points. They cannot be transilluminated, and show in the depths the pigment layer of the iris which even with the corneal microscope presents no details of structure. The defects are sharply defined outward, as well as on both sides where the tightly spanned iris-fibres rise up in ridges. The structure of the iris shows no other abnormalities.

CASE 6.—Andreas H., aged twenty, hair-dresser. In 1892 the patient was struck in the right eye with the fist several times. The eye became very much swollen, and sight was permanently lost. He did not seek medical advice until a month after the injury, when, he says, he was operated upon twice. On admission in July, 1902, the following condition was noted: O D (see Fig. 4), slightly divergent. V=perception of light with good projection. The eye is absolutely quiescent; the cornea is slightly oval, with the long axis running upward and inward. This change is due to a broad white scar running in a similar direction through the sclera, and extending a little over the corneal margin below. Within this scar there is dimly seen a bluish stripe below, and upward and inward a darker pigmentation. The cornea is clear, except for a small linear scar on the nasal side. There is no pupil. The anterior chamber is rather deep upwards and inwards, and becomes steadily shallower downwards by reason of an extensive anterior synechia at the lower corneal margin, formed only by the upper half of the iris. The individual fibres run almost vertically, and converge but slightly at the two outer margins of the cicatrix. The upper half of the iris is stretched across the anterior chamber like a tense curtain. At the point of incarceration there is a jumbled, felty, structureless brown mass, and attached to it the very much

attenuated iris, which shows a number of perforations. The atrophy is so far advanced that at three points large fissure-like arcades have formed, between which small bands of preserved iris-tissue are seen. Even in the crevices themselves fine shreds of iris-fibres appear running radially to the structureless membrane spoken of. Examination with the corneal microscope shows a distinct division of the iris, as to its structure into three parts, a middle and two lateral parts. The middle section corresponds to the point at which the lower margin of the iris retracts from the corneal scar, and runs almost vertically. At this point the iris is most thick, composed of straight and rather thick strands, and of a yellowish-brown color. This portion reacts to light by an up-and-down motion comparable to the play of the pupil. At the lower end of this triangular middle portion of the iris, and attached to its posterior surface and dimly seen through it, there is a grayish-white mass of shred-like exudation which participates in the motions of the iris just mentioned. The stretching of the iris-fibres increases, while their thickness and motility become less towards both sides of the above-mentioned ridge. The lateral portions of the iris are distinguished from the middle portions by large defects in the anterior layers which appear as dark splits. The superficial layer, as far as it is preserved, is of a greenish-gray color and exceedingly thin. Toward the upper corneal margin, the tissue of the iris is loose, spongy, and reticulated, while below it is rather ropy or stringy. A few threads of iris-tissue which still remain in the defects of the anterior layer appear tightly stretched and very fine. Between these threads the finely striated pigment layer appears which also participates in the motions of the iris-threads. In the upper part of the arcades arched threads connect one ridge of tissue with the next, and similar strands are found below. The defects of the stroma in the nasal half are darker than those in the temporal half, as the former contain mere stroma-fibres, while some of them have lost the pigment layer, so that, especially below, the opaque and dislocated lens can be seen through the defects as a whitish mass with rounded outline, while above there is some reflex on transillumination.

The last three cases show very instructively how the iris acts under the influence of abnormal traction. In all three, there is a prolapse of the iris, which has become adherent

and led to a fixation of the iris between this point and its ciliary attachment.

There were no marked inflammatory changes in the iris, although at the beginning of the disease and at the time of the prolapse, respectively, some irritation was present. This was certainly not severe enough to cause any marked tissue-changes in the affected membrane, so that the defects may be considered to a certain extent as due to mechanical causes. The principal factors are the intensity of the traction, which depends on the position of the point of incarceration, and then the length of time during which the iris has been subjected to the abnormal strain.

In Case 5, the iris suffered least from traction, as it is only a short stretch from the root of the iris to the corneal cicatrix, besides which the strain only acted for a comparatively short time, so that the only changes to be noted are two small defects in the anterior layer near the ciliary border; the pigment layer is not affected. This finding may be explained by the assumption that the anterior layer had suffered a loss of continuity at the root, where there is already a certain lack of resistance, and that for the time being this separation had not extended into the pigment layer. In consideration of the short standing of the condition, we are justified in considering the changes noted as the first stage of an iridodialysis. In Case 4, the changes are much more marked, and correspond to the long standing of the cause, actually amounting to ten years, which in the case of this girl took in the main period of growth of the eye. The two points between which the iris was stretched have separated quite decidedly with the growth of the cornea. This has been compensated to a certain extent, it is true, by the growth of the iris itself. The traction on the iris is, after all, not so great, as the distance from the ciliary border to the point of adhesion is little if any shorter than the entire width of the iris at other points. Although the iris tissue is otherwise entirely uniform in structure and without any crypts, lacunæ, or other differences in thickness, a blind caprice seems to have allowed individual iris-fibres to be preserved in the middle of the triangular area, while a little

to one side of it the atrophy of the anterior layer has advanced to complete loss of many of the iris ridges. This may be due to the fact that the atrophic portions of the iris were subjected not only to the traction but to a second vertical strain depending on pupillary motion. It is noticeable that the periphery of the iris, supposed to be lacking in resistance, is entirely unchanged, and that the atrophy first appears at a point nearer the leucoma. In the pigment-epithelium layer, we find a system of atrophic defects, which does not correspond at all with the apertures in the anterior fibres of the iris, so that the total area which can be transilluminated is somewhat lessened. In both layers, particularly the anterior, the long diameter of the openings is in the line of greatest traction.

Incomparably more marked are the changes due to excessive and lasting traction in the eye last described (Case 6), where we have to deal with an extensive traumatic prolapse of the iris, whose pupillary margin has also been implicated in the adhesion to the corneal scar. As the latter is situated almost at the limbus, the iris has been stretched to double its normal dimension, and the high degree of the strain is shown by the presence, in the anterior layer, of numerous defects, which are unusually extensive as the traction has been active for quite a number of years. Here again the direction of the defects corresponds to that of the drag on the iris. The presence of a number of openings has produced a stellate figure with the corneal scar as a centre. The pigment layer as before shows a certain independence in its reaction, expressed in a comparatively small number and extent of the defects.

A comparison of these three cases shows that the anterior layer of the iris has a greater tendency to the formation of holes, and that the defects in the pigment layer are smaller and do not correspond to the former. This might lead us to infer a greater resisting power of this layer, as Oblath has done from his observations.

This view, it is true, is opposed to the generally accepted belief that the pigment layer is practically inelastic and not at all tough, and clinical experience of the ease with which

posterior synechiæ are torn certainly speaks against any such resistance on the part of the pigment layer. The apparent contradiction is explained if we consider the inelastic friable layer as the posterior layer of the retinal pigment epithelium, while according to Grunert the anterior layers are particularly elastic on account of the presence of the easily stretched fibres of the dilatator. This elastic layer, the dilatator-lamina, is closely attached to the stroma of the iris, but can easily be detached from the superjacent retinal pigment-epithelium. The surmise naturally occurs that a separation of this sort may have taken place in the cases reported. Now there is not a trace of pigment to be found on those shreds of the anterior layer which have been preserved, and even if histologic proof be lacking, the conclusion seems justified that the separation between the two, iris-stroma and pigment-layer, took place as a whole, and that the muscular element of the posterior pigment-layer is accordingly to be sought in the pigmented membrane, which can be seen in the lacunæ of the iris-stroma. This is supported by the fact, noted in Case 6, that even where the stroma tissue is lacking, the remaining pigment-layer participates in the movements of the still extant elements of the stroma, contracts and expands, and so must contain elastic tissue. (The failure of the stretched and mechanically fixed pigment threads in Case 4 to react to homatropin proves nothing as to the existence of contractile elements in them.) We must bear in mind furthermore that the mechanical factors attending fixation of the iris after prolapse and synechia are not at all like the experiment of removing the posterior epithelium with a brush. Longitudinal traction on the surface of the iris could cause a diastasis of the two coats by gradual loosening. This occurs because the layer actually fastened to the cornea and thus impeded in its motion is the stroma, while the posterior layer containing the dilatator is not so firmly attached, and tends to contract where possible, and accomplishes this by partially freeing itself from the firmly fixed front lamina. Assuming constant oscillation of the pupil, the varying swing in the two layers would represent a mechanical factor of separation, which is still

further assisted by the difference in the histologic structure of the two coats to be seen under the microscope in any iris. The pigment layer is a structure which has much more cohesion than the loosely woven meshy iris-stroma.

This view is further supported by the consideration that it is hardly possible for the pigment epithelium, consisting as it does of a single layer of cells, to have remained intact as a membrane in spite of long-continued strain unless supported by the lamina of the dilatator in front. The nature of the tears, too, is not that found in membranes of one cell-layer, as in these the intercellular margins first become loosened by the traction, so that in the first stage of the process we should expect the formation of numerous small defects which would not coalesce and form larger ones until later. Comparing the two series of cases, we see that perforative atrophy, occurring as a result of severe irido-cyclitis following the formation of anterior synechiæ, involves both layers of the iris to the same extent where they have been simultaneously affected, and in accord with the inflammatory alteration of the entire iris, without any special localization. In traction atrophy following anterior synechiæ there is a certain regularity, the affected section varying according to the position of the adhesion, and the atrophy occurring in the most tensely stretched portion, with this limitation, that the pigment layer while degenerating maintains a certain independence in regard to the form as well as the extent of the defects and is less seriously affected by the process.

As to the interdependence of pigment layer and iris stroma, these clinical observations show the remarkable fact that the nature of the separation between the two layers varies with the location of the adhesion; posterior synechiæ causing a separation of the pigment epithelium from the dilatator lamina¹), while attachment to the cornea results in a division of the iris into stroma and pigment layer. Finally I may be permitted to report a case of circumscript

¹ This may go so far that in annular posterior synechia the play of the pupil is completely preserved; the iris, in contracting or relaxing, then moves over the surface of the adherent pigment layer.

atrophy of the iris, presenting conditions of which I have found mention in only one instance in literature. This was a case of perforative defect of the iris in an eye affected with chronic glaucoma.

CASE 7.—F. H., maid-servant, aged twenty-two, says that as a child she was always sickly and considered to be scrofulous. At fourteen she had an inflammation of the eyes which led to blindness overnight (?) In the following year she again became blind, and could not see for 18 days. After that vision gradually became worse. There is no history of specific or congenital affection. At the first examination in October, 1900, the following condition was found :

V O D, $\frac{6}{15}$, V O S, $\frac{6}{35}$, without correction.

O D (see Fig. 5) : No external evidence of irritation. Slight entropion of the lower lashes causing some corneal abrasion in the lower temporal quadrant. There are some maculæ at this point, as well as in a crescentic area at the upper margin and for several millimetres at the temporal border. The anterior chamber is shallow. The pupil is not quite circular and is displaced to the temporal side, reacting well to light and contracting promptly on the instillation of a myotic. At the nasal margin of the pupil there is a fine reddish-brown edging somewhat thicker at some points, which is entirely wanting on the temporal side. The pupillary portion of the iris, of a light yellow-brown, shows a structure of rather broad and in part irregularly thickened knotty fibres, and is continuous and on a level, above and to the nasal side, with the peripheral portion of the iris, which as a whole shows a like coloration. In the lower temporal region the peripheral portion of the iris is darker and inclines to black. Closer inspection shows a superficial layer of tissue consisting of scanty fibres, and a deeper one composed of a felty brown weave near the minor circle, and at the periphery, near the iris angle, a broad bluish-gray system of filaments arranged circularly. In the upper temporal portion there is a broad black split about 2mm wide, bounded above, *i. e.*, nasally, by a somewhat broader area of the deeper layer, and below, *i. e.*, temporally, by a rather thick fibre of the upper layer. A second split appears in the horizontal meridian, the bottom of which contains fine striate fibres. It is brownish gray, shallower and narrower than the other, and less extensive. Halfway

between these two defects there is a third which is hardly more than a small and shallow crevice. All three defects can be transilluminated.

The contour of the first aperture varies with the size of the pupil and with its changes as the pupil reacts. This also affects the tension of the fibres on the surface of the iris.

O S (see Fig. 6) : The eye is free from irritation. There is an annular opacity at the limbus, which particularly above and temporally shows a distinct radial striation and a bluish-gray hue. In the centre of the cornea there is a flame-shaped opacity composed of closely set, small punctate deposits, and a second less dense and of annular form, the borders of which are also cloudy. The corneal epithelium is clear and smooth. The anterior chamber is shallow. The pupil is of medium size, larger than the right, deep black, somewhat eccentric temporally and slightly oval ; it reacts well to light. There are no anomalies of the pupillary margin, and above all no synechiæ. The anterior surface of the iris appears lightly striated near the pupil. In the iris as a whole two layers can be distinguished. The anterior layer lies on a level with the pupillary portion of the iris and, beyond the minor circle, is composed only of strandlike fibres, with the exception of a broad area in the upper temporal region. The deeper layer represents the actual groundwork of the iris, and is composed of a more densely woven tissue. The most striking condition is found at the nasal side of the horizontal meridian. Here two brownish fibres with irregularly jagged edges diverge from the minor circle and embrace a black diamond-shaped opening. The upper fibre is attached at its central portion to the minor circle by an irregular network, is markedly constricted at the middle, shreds apart at the end, and disappears behind the opaque corneal margin with a triangular base at the iris angle. A little above this there is another slender fibre which appears lax or tense according to the size of the pupil. Below, *i. e.*, deeper than the above-mentioned narrow divergent fibre, and toward the periphery there is a lamina of loosely coiled radial fibres, belonging to the deeper layer of the iris, and having at its lower end two fibres of uneven thickness which, like the one described above, are stretched or relaxed by the play of the pupil. Above the superior diverging fibre the ciliary portion of the anterior layer has fallen out completely. Within this area the minor circle is unevenly edged. Some radial fibres run from it

to the deeper layer. At one point of the edge there is a fibre almost perpendicular to the surface of the iris which looks as if it had been torn off at its peripheral end and had snapped back. Besides this there are numerous crevices in the stroma of the iris in this region, not amounting to actual fissures, so that no transillumination of the iris is possible above the diamond-shaped defect already mentioned.

The lower pillar of iris tissue bordering the defect is broader, and ends in a triangular base-plate. Halfway between the minor circle and the ciliary margin, a small fibre runs back almost at right angles to the minor circle. At the point where it touches the pupillary portion of the iris there is a fine network, which also appears at the corresponding point of the upper pillar, and with its light threads and dark spaces looks almost like a Gothic lattice-work. The black aperture lying between the two pillars of iris tissue reaches almost to the ciliary margin, can be transilluminated, and takes on a long or rounded contour according to the size of the pupil, changing also with the pupillary play. Below and to the temporal side there are two more defects in the anterior layer, of which only a few fibres are left, enclosing dark meshes, but without any real perforations. The fundus of both eyes shows typical glaucomatous excavation with distinct hooking of the vessels. There is marked concentric contraction of the visual fields. Intraocular tension is not decidedly increased.

It is not easy to interpret this unusual finding: the formation of a circumscribed defect or accessory pupil in the iris. The question arises whether we have to deal with a congenital defect, an irido-dialysis, or limited aplasia usually summed up as polycoria, or whether this loss of iris tissue is to be considered as a result of the glaucomatous process.

The clinical picture of iris-atrophy in glaucoma, which Schnabel has so classically drawn, shows generally no focal localization, being characterized rather by a true wasting of the tissue, which affects the appearance of the whole surface of the iris, advances centrifugally, and leads to a narrowing and thinning of the entire diaphragm. The iris in glaucoma is further marked by the behavior of the pupil and by

the tendency of the pigment layers to proliferate and to turn over the pupillary margin (ectropion uveæ).

With regard to Case 7, there is no evidence of the iris being concerned in the glaucomatous process except the defects in this coat. It is especially to be noted that the details of the iris are clearly marked, and that its color and brilliancy do not indicate an atrophic process. Accordingly we must consider the form of glaucoma manifested in this case as a glaucoma simplex, involving the posterior parts of the eye, especially the optic nerve. The absence of a history of typical glaucomatous attacks, the reaction and small size of the pupil, and the tension, hardly admit of any other interpretation. The sudden fits of blindness mentioned by the patient are probably nothing but blepharo-spasms occurring in the course of the keratitis which led to the cornea opacities. This would account for the slight entropion of both lower lids as residua of the spastic condition.

In a review of the literature we find that Bentzen and Leber have described an almost exactly similar case of circumscribed defect of the iris. The patient was a woman of twenty-eight, who had become blind through absolute glaucoma. In her case: "The pupil is wide and motionless; below it there is a secondary pupil, divided by a small bridge of tissue from the first, and reaching almost to the ciliary border. Edge of the pigment layers broadly everted."—"As to the formation of the accessory pupil, all that could be ascertained from the history of the case was that when the patient was only fourteen years old a small black spot had appeared near the pupil and slowly grown larger (?)." And farther on: "The iris is in part markedly atrophic, and this seems to have given rise to the double pupil noticed *intra vitam*. In sections running through the margin of the accessory pupil all of the iris tissue but the pigment epithelium has disappeared."

Franke's work on polycoria contains a number of similar observations. In the interpretation of our findings the question must also be considered whether the defects might not have been due to the antecedent inflammatory processes in both eyes. The absence of synechiæ and of capsular

deposits speaks against this possibility, and excludes any adhesion of the pupillary margin which would have been firm enough to allow the presumption of a mechanical traction.

We are thus led by exclusion to the hypothesis that the condition is probably congenital, although unfortunately there is nothing in the previous history to support this view.

Histologic examination would clear up the pathogenesis of such a case. The clinical conception is supported by the otherwise quite normal structure of the iris. We might apply to our case and to the formation of an accessory pupil the theory of Manz as to developmental defects of the choroid, as far as the existing glaucoma points to an anomaly of the choroid or to a disturbance of the general nutrition of the eye.

NOTE.—The corneal opacities have not been shown on the illustration, as they would have obscured the details of the iris. The right eye is shown represented with the pupil under ordinary conditions; the left, under homatropine.

TRANSACTIONS OF THE OPHTHALMOLOGICAL
SECTION OF THE XVTH INTERNATIONAL
MEDICAL CONGRESS AT LISBON APRIL 19-26,
1906.

REPORTED BY DR. VON PFLUGK, OF DRESDEN.

Translated from the German Edition for May, 1906, by Dr. MATTHIAS
LANCKTON FOSTER.

FIRST MEETING, FRIDAY, APRIL 20, 1906.

Vice-President FREDERICO MEYER, of Lisbon, opened the session with a brief speech of welcome. Chairman JOSEPH, of London, later v. GROSZ, of Budapest, presided.

I. General Subject: **Myopia and its Treatment :**

(A) SATTLER (Leipsic), in the name also of his conferee C. HESS, presented the following conclusions:

1. It is possible to prevent increase of myopia by its constant full correction with maintenance of a sufficient working distance and avoidance of too great a lowering of the visual plane.
2. The full correction can frequently be worn by young people with myopia of 10 D or even more.
3. If then it is still progressive the progression is usually only slight.
4. Even in high myopia it is necessary to produce by means of the correction a working distance of at least 20 to 25cm.
5. A timely, proper correction seems to act as a protection against the dangers which threaten the myopic eye.
6. The insufficiency of convergence is usually relieved sufficiently by the full correction of the myopia to prevent any annoyance.
7. Muscular asthenopia from exophoria necessitates, in addition to the correction of the myopia, a tenotomy of one or both external recti, rather than a corresponding combination of prisms.

8. In myopia of 18 D or more in young people up to the end of the thirtieth year the extraction of the transparent lens is to be recommended.

9. Fukala's method of primary extraction is preferable to primary discission because of

- (a) the less number of operations ;
- (b) the much quicker restoration of good vision ;
- (c) the much greater security from loss of vitreous ;
- (d) the avoidance of increase of tension and of its consequences ;
- (e) the apparently less danger of post-operative retinal detachment.

(B) UHTHOFF (Breslau): The treatment of the intraocular complications of myopia, particularly retinal detachment (Author's abstract).

UHTHOFF referred to the treatment of the intraocular complications particularly met with in high myopia. First the treatment of spontaneous detachment of the retina, ascribed in more than half the cases to myopia, is considered, based on the observation of over five hundred cases which have been reported on former occasions. By a cure of the detachment Uththoff means a re-attachment of the retina with no reference to the amount of vision restored, so that a blind eye might exhibit a cure of the retinal detachment.

In these five hundred cases of spontaneous detachment of the retina, myopia was present in about 60 %. In about 4.5 % of all cases of myopia observed by Uththoff himself there was detachment of the retina, though other authors find the percentage much less—Hertel 0.96 %, Proskauer 0.71 %, and Schleich 2.3 %. It naturally makes a great difference whether the material is accumulated in an eye clinic, where detachment is not rarely met with, or in statistical investigations, as of schools, outside of the eye clinics.

The treatment of retinal detachment is non-operative and operative. Among the non-operative therapeutic means are to be enumerated the pressure bandage, rest, diaphoresis by means of pilocarpine or salicylate of soda, the use of resorbents such as iodide of potassium, iodide of sodium, and mercury, the internal administration of organic preparations, purgatives, bleeding counter-irritation, and the instillation of dionin into the conjunctival sac.

The pressure bandage associated with absolute rest is still a

means advocated by most authors, though occasionally it is directly denounced.

Injections of pilocarpine have been productive of very good results according to some authors, not so good according to others, while occasionally this method of treatment has been rejected as too offensive for the patient. Some authors ascribe a special value to salicylate of sodium, and a certain favorable influence on the diaphoresis by means of the salicylates cannot be denied, although Sattler correctly pointed out that so immediate an influence on the subretinal fluid or on the supposed choroiditic process cannot be expected as on chronic exudates of accumulations of fluid in other parts of the body.

The medicamentous treatment of retinal detachment, iodides, mercury, etc., was based chiefly on the theory that a choroiditis was the cause of the disease. With the change in theory as to the pathogenesis of detachment, this method of treatment has fallen into disuse, and cases of true syphilitic detachment are extremely rare. Uthoff is not sure that he has ever seen a case.

The use of antiphlogistics, leeches, foot-baths, sinapisms, etc., has been recommended, but they have never proved very useful. The same is true of drastic purges, the internal use of organic preparations, and the instillation of dionin or eserine into the conjunctival sac.

Operative treatment includes:

1. The puncture or division of the detached retina in order to form a communication between the vitreous and the subretinal space, which was soon abandoned.

2. Scleral puncture in the region of the detachment. A simple and harmless procedure which in connection with a pressure bandage occasionally is of benefit. Various modifications of the operation have been proposed, but without any true improvement.

3. The attempts to produce constant drainage of the subretinal fluid are to be considered abandoned.

4. Electrolysis aimed at the direct resorption of the subretinal fluid and a secondary inflammatory reaction on the part of the choroid which would be favorable for reattachment. Good results have not yet been obtained.

5. Iridectomy. The results varied, but on the whole were poor.

6. Attempts to excite an adhesive inflammation of the choroid by the introduction of irritating substances into the subretinal

space. Some reports were relatively favorable but there arose many objections to the operation and reports of disastrous results. Experimentally severe reactions were obtained in the eyes of animals in this manner. Later Schoeler tried painting the bared sclera in the region of the detachment with tincture of iodine to obtain the desired inflammatory reaction of the choroid.

7. The punctate cauterization of the sclera in the region of the detachment with the Pacquelin or galvano-cautery was doubtless able to excite a certain inflammatory reaction in the choroid lying on the sclera, as was shown by experiments on animals, and was performed several times for therapeutic purposes. In association with other means, such as subconjunctival injections of salt solution, Dor has obtained relatively very good results.

8. Subconjunctival injections, particularly of salt solution, are dealt with extensively, the writer going into their history and the question of the explanation of the method of their action. Some have recommended the use of strong salt solutions, 20 to 30%, but he thinks they should never be employed. Darier recommends the addition of dionin, as well as the subconjunctival use of sodium sulphate, sublimate, hydrargyrum oxycyanate, etc. A direct action of the substance injected subconjunctivally is not to be expected when the sclera is intact.

9. The combination of a fine perforation of the sclera in the region of the detachment with subconjunctival injections came next. Strong solutions are to be avoided on account of the danger of changes within the eye, particularly hemorrhages. According to Dor the combination of circumscribed cauterization of the sclera with subconjunctival injections of salt solution may be used.

10. During the last year the intracapsular injection, *i. e.*, into Tenon's capsule, has been advocated instead of the simple subconjunctival. But strong solutions thus used may likewise injure the eye. The writer has seen two such cases, and other authors have reported injuries due to prolonged subconjunctival use of too strong solutions of salt.

11. Uthoff next turns to Deutschmann's operation. The injection of vitreous he has not used chiefly because in a series of experiments instituted by Wernicke severe reactions and destructive changes were induced in a portion of the cases by the injection of preparations of the vitreous as given by Deutschmann. Uthoff also raises various objections to Deutschmann's incisions

through the vitreous and retina and is of the opinion that their performance in the way described by him is frequently impracticable on account of the anatomical conditions. Deutschmann himself has greatly modified his operation.

12. The plan to replace the retina in myopic eyes by diminution in size of the tunics of the globe and removal of the sub-retinal fluid gave several good results. Uhthoff considers the operation too extensive to be of general value in ophthalmological treatment. Severe vitreous hemorrhages have been observed several times.

Uhthoff then passed to his own observations. Of all the cases of cure of retinal detachment reported in literature, 24 % recovered under operative treatment, 45 % under non-operative, and 31 % under no treatment whatever. In thirty-six recoveries among 422 cases in his own material, eighteen were spontaneous, ten took place under non-operative treatment, and eight under operative, a total of 8.5 %. The second part deals with the other intraocular complications of myopia, changes in the choroid, retina, and vitreous. The treatment of myopia by operation or by glasses is not included in the scope of the paper.

Uhthoff first gave statistical data in regard to the occurrence of the intraocular complications of myopia and recommended that these complications be divided into groups with reference to their treatment.

1. Those which are slowly produced by the mechanical stretching of the posterior segment of the globe, conus, diffuse pigment atrophy, dehiscences in the region of the posterior pole of the eye. These are not amenable to treatment.

2. The large, sharply defined choroid patches, which result in atrophy of the choroid, proliferation of pigment, which occasionally leave behind gray or grayish-black scleral scars, which not rarely are the source of hemorrhages both in the choroid and in the retina. These are quite analogous to the true choroidal and chorio-retinal changes.

3. The so-called black spot in the macular lutea. In the last two groups treatment is necessary. Mercury and the iodides internally, with mild saline cathartics, are indicated, while bleeding, dry cups on the temples, and particularly hot foot-baths are sometimes useful. Subconjunctival injections of salt solution are valuable to a certain degree, though much overestimated. Atropine is useless in high myopia, as is also local massage of the eye,

but general massage of the body may be occasionally of service. Treatment with the constant current has not proved efficient, any more than treatment with myotics. The removal of the lens has no curative effect on the intraocular changes. The so-called neuritis of myopia is often only the expression of a symptom of superraction and therefore is not a subject for medical treatment.

Isolated floating bodies in the vitreous offer no opportunity for therapeutics, while large inflammatory vitreous opacities, hemorrhages, etc., are to be treated in the same way as the above-mentioned choroidal and retinal changes, groups 2 and 3.

DISCUSSION OF SATTLER'S AND UHTHOFF'S PAPERS.

AXENFELD (Freiburg). The refraction should be accurately determined under mydriasis with a stenopaic slit. The markedly good results obtained by Deutschmann's methods must stand the test of time from an objective standpoint.

WICHERKIEWICZ (Posen): When the pressure bandage is not serviceable it is because it has not been properly applied. He had had the opportunity to demonstrate a good result, obtained by treating detachment of the retina with electrolysis.

DA GAMA PINTO (Lisbon): As 50% of the recoveries from detachment are spontaneous, and of the remaining 50% part follow the treatment immediately, and part after the lapse of some time, it is probable that the number of spontaneous recoveries is greater than 50%, and the question must be asked whether the treatment has not interfered with the process of healing. In many cases a pressure bandage is unbearable on account of pain, so the only bandage which can be worn is simply protective, and this is useless in the treatment of detachment.

VOSSIUS (Giessen): One should always try to give the full correction for myopia, but in myopia of moderate degree the obstacle is frequently met with that the patients refuse to wear glasses for near work. He has seen no true increase of myopia when the full correction has been worn. Detachment after discission for myopia of high degree is certainly not in all cases to be ascribed to the operation, for in one case he observed the onset of the detachment a few hours before the time determined on for operation. This patient then went to Deutschmann, and returned with hemorrhage in the vitreous.

VON PFLUGK (Dresden) reported four cases of detachment,

which he had treated according to Deutschmann's method. In two cases reattachment took place, one case was lost through vitreous hemorrhage and iritis after vitreous injection, and one was permanently improved by the vitreous injection.

OSTWALD (Paris) considers periscopic glasses very useful for increasing the visual acuteness, especially in peripheral vision, and for lessening the discomfort caused by the glasses in near work. For this purpose the "orthoscopic" glasses recommended by Tscherning accomplished nothing. He also spoke in favor of the galvanolytic treatment of retinal detachment, and reported a case of very extensive detachment which he had treated more than twelve years before, and still retained nearly perfect vision.

FRANKE (Hamburg) agreed with Axenfeld that Deutschmann's results must undergo the test of time. He had observed a case of spontaneous recovery from detachment, with good permanent vision. Deutschmann's treatment is not without danger, and it is a matter for consideration whether in consequence of it the condition of the patient may not be made worse, and enucleation become necessary, on account of the severe irritation caused by the injection of vitreous.

1. WICHERKIEWICZ **Retinitis punctata albescens** (author's abstract). This form of retinal disease, first described by Mooren, is still rarely correctly recognized. Wicherkiewicz collated the cases described in literature, excluded some from this group, reported an accurately observed case of his own, and stated the following conclusions:

(1) Retinitis punctata albescens is a disease which is distinctly definable clinically and ophthalmoscopically.

(2) The vision and the visual field are usually normal, but night blindness exists, so that with reduced light the central vision is lowered and the fields for colors are greatly narrowed.

(3) Ophthalmoscopically numerous little spots are visible behind the retinal vessels, which do not invade the macula or extend beyond the ora serrata. The central vessels are often unchanged, there are no opacities of the vitreous and no posterior capsular cataract.

(4) Consanguinity is to be considered the cause, while syphilis, both hereditary and acquired, is excluded.

(5) This punctate retinitis may be associated with other diseases of the interior of the eye, and may then be overlooked. On the other hand, forms of retinal disease which have nothing in com-

mon with this may be mistaken for it, hence caution and exact demonstration are necessary.

(6) It is probably a variety of retinitis pigmentosa, as the retinitis pigmentosa sine pigmento, when present, may be taken to be a beginning of retinitis punctata albescens.

(7) The disease seems hardly amenable to treatment, but in regard to this nothing certain can be said.

DISCUSSION.

GRADLE (Chicago) had prepared a paper on this subject, but in order not to take up the time of the meeting presented it in the form of discussion.

The various forms of retinitis punctata (author's abstract).

The name retinitis punctata is applied to several groups of pathological pictures, between which there are transitional types.

1. There are cases with a moderate number of white spots in the fundus, usually surrounding the optic nerve and reaching to the macula. The vision may be normal or moderately reduced, particularly in the eye with the larger number of spots, or the patient may complain simply of asthenopia. These spots pass away in a few months, especially if iodide of potassium is administered. 2. A more important disease, with marked lowering of vision, and frequently with central scotoma, begins frequently with other retinal changes, exudates, and hemorrhages, while the white, minute spots develop later. Occasionally the disease starts as an optic neuritis not recognizable ophthalmoscopically (retrobulbar?). It is disclosed through the scotoma, which cannot be explained by the condition of the fundus, and many times by the subsequent atrophy of the nerve. The disease may usually be improved or cured by treatment, but the vision may be badly impaired. There are probably transitional types between 1 and 2. The choroid is often secondarily affected, and vitreous opacities are formed. In two cases a connection between this form of punctate retinitis and neuritis was probable. The writer has seen in all about a dozen cases of these two forms. 3. Finally is the form which Fuchs has properly denominated retinitis pigmentosa. With this night-blindness is present, frequently with good vision, which usually remains stationary for a long time. The characteristic pigment changes may be found in the periphery, or they may be absent. The white spots scat-

tered over the fundus are then characteristic. The author describes one case of this form.

2. F. MEYER (Lisbon) : **Blindness in Portugal.**

The former statistics of the blind in Portugal stated nothing with regard to the causes of the blindness. A recent census gives 6222 blind and 6320 one-eyed among 5,166,841 inhabitants of Portugal, 12 : 10,000. To determine the causes of the blindness the Journal of the Ophthalmological Institute for the past fifteen years was used, whence the causes of the blindness in 2041 cases was learned.

The blindness was congenital in 9.1% of all cases, was due to traumatism in 8.6%, and to small-pox in 7%. Among the one-eyed the number due to traumatism is very great, the percentage due to a single form of injury 40.7.

Since 1901 vaccination has been obligatory, but because of insufficient control epidemics of small-pox still occur.

The most important causes in the number taken from the Transactions of the Institute were tabes, meningitis, trachoma, 3.2% ; gonorrhœal ophthalmia, myopia, and glaucoma, 35.17%. In many parts of Portugal trachoma is endemic, and 12% of all the patients at the Ophthalmological Institute suffer from this disease. The number of glaucomas, 35.17% of the entire number, is so great because almost all cases seek treatment too late, and also because the instruction in ophthalmology of the country practitioners is too slight.

Blindness could be avoided or cured in 50% of the cases. The danger of blindness is very slight in childhood, increases gradually as the persons grow older, and rapidly in old age. Stone-workers are the most frequently affected, then fishermen and hunters, then farmers.

SECOND DAY, SATURDAY, APRIL 21, SATTLER PRESIDING.

II. **Serotherapy in ophthalmology.**

AXENFELD (Freiburg). After a brief introduction he said that this treatment is of primary reliance against infection with diphtheria bacilli. The healing action of the serum is indubitable to-day, and Axenfeld takes the ground that the serum should be used not only in all severe and well-marked cases, but also in all cases of pseudo-membranous conjunctivitis in which Loeffler's bacilli are present ; for it cannot be denied that a slight affection of the eye may be complicated by a severe and fatal affec-

tion of the throat, and that very mild cases may transmit the contagion to others in whom it may prove very serious. Subcutaneous injection is the best method. In addition, reference was made to experiments with the so-called xerosis bacilli concerning which there is as yet no unity of opinion. The actions of xerosis bacilli, after they have been experimentally injected into the vitreous, are not influenced by the antitoxic diphtheria serum.

The antitoxic tetanus serum has also been found to be useful in ophthalmology, and serum therapy is particularly of value in infections with pneumococci.

The difficulties of investigation are especially great, and it is through Römer's valuable labors that all the results of these investigations have been practically utilized for the field of ophthalmology.

Axenfeld spoke next of the different forms of immunity on account of the possibility of other infections: the active, the passive, and the last found but perhaps very important aggressive immunity. Dacryocystitis and pneumococcus conjunctivitis are pneumococcus diseases which are hardly to be subjected to the serum therapy because of their benign character and the safety of other means. On the contrary, this treatment is very desirable in corneal infections, especially in *ulcus serpens* and in post-operative infections. Passing to Römer's special serum therapy, Axenfeld spoke of its prophylactic use. The immune serum, together with the incorporation of dead cultures, is to be recommended for this purpose. Römer's statements regarding the division of practising physicians underwent a critical review. Axenfeld desires that the practising physician should despatch cases immediately after prophylactic injection, when, in spite of this, inflammatory symptoms appear. He also discussed the opinion which would oppose the use of serum therapy by the general practitioner in well-marked hypopyon keratitis, especially on account of the possibility of other infections. The removal of material for investigation from the ulcer by the general practitioner he considers hazardous because of the danger of propagation. The proper treatment must immediately follow any such removal.

Next followed the therapeutic use of serums and of cultures. Axenfeld collated the experiences related in literature and added new material, partly his own cases, partly the result of collective

investigation. Unfortunately, the later results have not been as excellent as the former. To 74 published cases he has added 111 new ones, thus obtaining 185 for investigation, and considered the questions of dosage, the clinical course, and the different indications in tabulated form. Of these 185 cases, 57 were treated with passive immunization in the first, most favorable stage, 41 with 10ccm, 16 with 20 or more ccm. Of the first 41, 20 remained progressive, 21 were checked. A certain healing action cannot be denied the serum in this stage, even though it cannot be thoroughly relied upon. Of the 16 treated with 20 or more ccm, 6 were checked and 10 progressed, thus making a total of 27 cases cured, and 30 progressive; 61 cases in the second, more advanced stage were treated with passive immunization; 9 were cured, 29 were not cured by 10ccm of immune serum; 6 were cured, 17 were not, by 20 or more ccm,—a total of 15 cured, 46 not cured. Some took enormous doses, 60 to 90ccm, but the largest single dose was 30ccm. The value of conjunctival instillations could not yet be clearly determined. From this it appears that the serum therapy alone is justified only in the first stage.

From those not exactly brilliant results, one passes to the combination of the active method, the injection of cultures, with the passive, injection of immune serum. The first should precede and be given intramuscularly, and afterward the other may be given subcutaneously. Axenfeld adds 13 cases to Römer's 24, making a total of 37. Unfortunately the later results are again less favorable than the early ones. Römer reported 20 cures out of a possible 24, while only 4 of the 13 were cured and the rest remained progressive. The combined method is the most efficacious, it is permissible in the first stage, but it must not be relied upon. Successive larger doses may be given, though the expense soon becomes very great, but when such an ulcer is finally checked, an uncertain result even with 90ccm, the resultant scar is perhaps larger than it would have been if it had been cauterized in the beginning. In medium-sized and large ulcers, the use of the combined method alone is also not to be recommended. It is to be hoped that the most recent and, as yet, unproved aggressive method will give better results.

Another very limited field for the use of the serum is the pneumococcus infection after deep injuries and operations.

The action on the interior of the eye is still less. A true immunization of the vitreous cannot be obtained even with the aggressive method. Prophylaxis is of the first importance because it is difficult or impossible to influence the disease when it has become established. A streptococcus and staphylococcus serum therapy is not of consequence in ophthalmology because cases which need them are not frequently established, and the serums are doubtful in their action.

The serum therapy suggested by zur Nedden for sympathetic ophthalmia needs further investigation.

The same may be said of the curative power of Römer's jequiritol serum in severe jequiritol ophthalmia.

The injection of hæmolysin in internal hæmophthalmus has not developed into a useful means of treatment.

A further study of immunity with special reference to the eye is indispensable to modern ophthalmology.

3. CABANNES: Diseases of the optic nerve in hereditary syphilis (résumé).

These diseases of the optic nerve are relatively rare, and may appear in the form of optic neuritis or optic atrophy. This second clinical form is the usual natural result of the inflammation of the nerve. In very rare cases the atrophy appears to be simple, not neuritic. The optic nerve is then white, its margins sharply defined, the arteries more or less reduced in size, the veins of their normal calibre. The retina and choroid appear absolutely uninjured. The cases we have had an opportunity to see are three and belong to the latter category (atrophia optica heredo-syphilitica). This form of optic atrophy is extremely rare; the form which follows neuritis is much more frequent. Its development depends on the optic nerve itself, either in the form of a retrobulbar neuritis, of a descending neuritis, or of a local phenomenon associated with a retino-choroiditis due to hereditary syphilis. The post-neuritic atrophies may also be called secondary, while the others are primary. Primary atrophy due to hereditary syphilis appears not before the seventh or eighth year. Its course is progressive and disastrous, although in many cases it may be arrested, and even an improvement brought about by means of mercury if given very early. It is therefore indispensable to trace out the true ground of this optic atrophy and to prescribe energetic syphilitic treatment. In

addition, it is recommended that children of parents with hereditary syphilis, when they present only slight symptoms of syphilis at birth, or the mother has previously aborted, should undergo mercurial treatment for several years in order to ward off the onset of symptoms of congenital syphilis.

4. CABANNES : **Blepharoplasty according to the Italian method** (résumé).

The Italian method of blepharoplasty is employed only exceptionally, when the skin about the orbits has been destroyed or is cicatricial and conditions are not favorable for sliding flaps or skin grafting. The flaps are taken from the inner surface of the forearm and made perhaps a third larger than the surface to be covered. The forearm is then fixed to the head with a plaster-of-Paris bandage, so that the flap will not be displaced. The flap may usually be cut away seven days after the operation. Tagliacocci and his followers waited much longer, from fourteen days to three weeks. The earlier separation of the flap lessens the duration of the pain caused by the position of the arm and the head, and the flap has by that time obtained its vitality. A tarsorrhaphy must be performed, and the lids should not be opened for a month. The contraction of the transplanted flap and of the subjacent tissue proceeds very slowly. The tarsorrhaphy prevents the retraction of the flap.

DISCUSSION.

WICHERKIEWICZ: If the ectropium is not too large Thiersch's method gives good results. When the defect is very large, pedunculated flaps are necessary. Wicherkiewicz has employed Wardworth's method many times, but has abandoned it on account of the excessive contraction of the flaps.

5. CRAMER (Cattbus) : **The occupation myopia of cloth-darners** (author's extract).

I have demonstrated that cloth-darners are subject to a typical occupation myopia by a systematic examination of 100 such workers, taken without selection from three factories.

The duties of the darners are to search faulty places in the rough cloth, to repair broken or unequal threads, and to repeat this after the cloth has passed through the fulling and shearing process. This mending resembles the darning of stockings, but is very much finer and more exact.

Sixty-seven per cent. of the 100 had pronounced myopia, in 21 with astigmatism. Of those employed in two factories 74% were myopic, of those in the remaining one, 64.7%. The degree of myopia ranged from 0.75 to 9 D, the ages from fifteen to fifty-one years. The duration of the darning has a very uneven influence. The visual acuteness frequently showed a certain decrease in the moderate degrees of myopia, but only for distance. Heredity has practically no influence. Formerly (my observations have occupied fourteen years) I met with an extraordinarily large number of cases of spasm of the accommodation. As years passed by they became fewer, and are not to be met with now any more frequently than in other callings.

The diminution of this disease is wholly due to the change from the unsteady open gaslight to the gas mantle and electric illumination. The factory with the smallest percentage of myopia has been lighted with electricity for twenty years.

The injurious influence in the darning is the search for the object, the same as in learning to read among young children. The later power of the imagination and the difference between the black letters and the white paper is wanting. On the contrary, the hyperæmia due to work is greater on account of the bowed position and the nearness of the artificial light.

The results are the same as in school myopia, and never assume deleterious forms in eyes which are normal at the beginning.

The activity of the darning is practically perfectly even year after year, in comparison with the individually varying labors of the student. The observation of the very different results with exactly the same strain for the same length of time forces the assumption of a different bodily disposition, and this is furnished, I think, in Stilling's theory of the influence of the varying arrangement of the superior oblique.

Hygiene, so far as artificial light is concerned, is constantly improving. An attempt to secure correction of the error and the maintenance of a better position among the darners is, in my opinion, in vain, because they do not recognize their deficiency.

6. VOSSIUS: Ring-shaped opacities on the anterior surface of the lens after contusions of the eye (author's abstract).

The six observations described by A. Keller in his dissertation directed the attention of the author to this otherwise undescribed

result of a contusion of the eye without rupture of the globe. It appears usually, after dilatation of the pupil by examination with a plain mirror and a strong convex glass, as a ring-shaped opacity in front of the red reflex, placed centrally, and with a diameter of about 3mm. The ring usually seems to have a uniform thickness and to be placed where the margin of the pupil lay on the anterior capsule. It perfectly resembles a cast of the pupillary margin.

In two cases it was of a brownish color and visible by oblique illumination with the aid of a loupe. In four cases the non-pigmented ring could be seen only with the plane mirror with a strong convex glass. In one of the first-mentioned two there was within the ring a grayish opacity of the capsule, which later disappeared. In those patients in whom it was visible only with a mirror one could recognize by means of a strong glass that it was punctate.

Within four weeks these rings disappeared and left no trace. No lenticular opacities developed, and in the uncomplicated cases the final vision was normal. The complications were hemorrhage into the anterior chamber, once a slight rupture of the sphincter, and once a rupture of the choroid with vitreous opacities. The ring-shaped opacity on the anterior surface of the lens could not be seen until after the blood in the anterior chamber had been absorbed.

Vossius explains this opacity as a cast of the pupil on the anterior surface of the lens. Either pigment is squeezed out of the cells at the margin of the pupil by pressure of the cornea and iris against the lens and then fixed on the anterior capsule by fibrin, so as to produce a brown ring which resembles that sometimes seen in plastic iritis after dilatation of the pupil, but, unlike the latter, disappears completely after a time, or the pressure of the iris against the capsule produces a non-pigmented ring by causing transient degenerative changes in the epithelium of the capsule similar to the contusion cataracts produced experimentally by O. Schirmer, which undergo complete regeneration and become invisible.

DISCUSSION.

AXENFELD asked whether radiating lines had been observed in the region of the opacity.

VOSSIUS has seen radiating marks in one case, but these disap-

peared under treatment, and thus demonstrated that the opacity belonged to the capsular epithelium.

THIRD DAY, MONDAY, APRIL 23, 1906, WICHERKIEWICZ
PRESIDING.

III. Tuberculosis of the eyes.

TREACHER COLLINS (London): After a brief historical account the writer formulated the three classical methods of demonstration of the tuberculous nature of a disease, the histological, experimental, and bacteriological. The most certain and most convenient way is the inoculation of the tuberculous material into the anterior chamber of rabbits or guinea-pigs. The ways in which the virus may be introduced into the eye vary. Greeff and others have seen tuberculous disease result directly from injuries to the eyeball. Endogenous infection was first described by Cohnheim in connection with miliary tuberculosis, a disease in which it frequently occurs, usually in the choroid, more rarely in the iris. In many cases tuberculosis of the eye occurs as a secondary affection to tuberculosis of the bones, joints, glands, or skin.

Tuberculosis of the eye has been met with at all ages from 4 months to 62 years, but is most frequent between the 5th and 25th years. The eighteen cases presented by the writer in tabulated form were between the ages of five and fifty-six years.

Sex appears to exercise no influence, the larger percentage perhaps occurs in females. The most frequent method of introduction into the eye is through the circulation when the tuberculous foci are most frequently found at points of vascular anastomosis, or in the narrowest places of the capillary network.

Opinions differ in regard to the frequency of ocular tuberculosis. Most authors consider it very rare. Michel considers tuberculosis a much more common etiological factor in eye diseases than it is usually supposed to be, and L. Bach asserts that it is not a rare condition.

The histological and clinical picture of tuberculosis of the iris, ciliary body, choroid, sclera, lens, retina, and optic nerve was described. The diagnosis is usually difficult. Injections of tuberculin give efficient aid. Inoculation of the aqueous into rabbits' eyes gave positive proof to Gourfein in two cases. It may be confounded with syphilis, ophthalmia nodosa, lepra, and

sarcoma. The rapid penetration of the sclera by tuberculous growths is of diagnostic importance.

Intraocular tuberculosis may result in caseation, perforation, and shrivelling of the eye, or cicatrization of the nodules. Tuberculin has given different results in men and animals. Schlick obtained better results with T. R. (Koch, 1897) in men than in animals.

Iodoform introduced into the eye seems to weaken the tuberculosis; at any rate it may be considered an aid to other means used at the same time. When the ocular tuberculosis is primary the removal of the eye is important, to guard against a general infection of the body, particularly if it has not been perforated; but its non-removal does not necessitate a fatal result. Some cases have been cured by excision of the diseased portion of the iris. In cases 2 and 7 of those here reported tuberculous granulations appeared in the iridectomy wound, so that enucleation was finally necessary.

DA GAMA PINTO reported a number of patients with ocular tuberculosis treated with T. R. Part were still under treatment.

DISCUSSION.

JESSOP (London) stated that of 15 cases of tuberculous chorioiditis which he had seen, 14 had tuberculous meningitis. He believes that all cases of miliary tuberculosis have tubercles in the choroid. Tuberculin should be given in all cases of ocular tuberculosis. The histological picture is not infallible in the diagnosis of this disease. He does not believe that it ever occurs as a primary disease.

CRAMER (Cottbus) has obtained very good results in ocular tuberculosis from the use of hetol.

FRANKE spoke highly of the diagnostic value of alttuberculin. The therapeutic results obtained with T. R. are to be received with a certain amount of caution, because of the possibility of spontaneous recovery,

UHTHOFF said that he had found recovery not infrequent after treatment with tuberculin.

HILLEMANN (Duisburg) had obtained a brilliant result with T. R. in a case of very severe intraocular tuberculosis, after the diagnosis had been confirmed by means of old tuberculin. He considered clinical treatment unnecessary or even bad.

7. VON PFLUGK (Dresden): The form of the lens in the rest-

ing and the accommodating eye of the ape (*Macac. cynomolgus*) demonstrated from photographs of the eyes under atropine and under eserine.

The forms of the lenses corresponded in general to those given in literature, and showed under strong accommodation :

- (a) increased curvature at the anterior pole ;
- (b) sloping toward the equator ;
- (c) broadening of the equatorial region ;
- (d) increased curvature of the posterior surface, with sloping toward the equator ;
- (e) formation of a circular zone, incurvated toward the interior of the lens at the base of the lenticonus posterior (a new observation) ;
- (f) decrease of the equatorial, and increase of the anterior posterior diameters.

As the basal form of the lens approaches the spherical, it follows that under accommodation it departs from the approach to the spherical form postulated by Helmholtz for the accommodating lens.

DISCUSSION.

OSTWALD (Paris) noted the omission of a description of the technique. The form of the lens in accommodation could not be explained through relaxation of the zonula, Helmholtz's theory, for the elasticity of the lens could not produce the described change of form of the posterior surface of the lens. The theory advanced by the writer, tension of the fibres of the zonula during accommodation, could explain without difficulty partial changes in the form of the lens, perhaps to offset a conical astigmatism.

TREACHER COLLINS has observed the same form of the lens in the eye of a child which was enucleated for buphthalmos as that described by the writer of the lens under the influence of eserine, and ascribed its origin to tension on the fibres of the zonula.

VON PFLUGK, in closing, briefly described the technique which had been called for.

8. OSTWALD (Paris): **Demonstration of the thermærophor** (author's abstract).

The thermærophor is a small apparatus used for the purpose of applying hot air in baths to the eye, the ear, or other circumscribed portions of the body. A temperature of from 150° to 180° may be obtained by its means, and is under the control of

the patient, so that the limit of tolerance is never passed. The first model, described in 1904, was heated with gas; the one exhibited at this time, by means of electricity. It is useful in the treatment of many chronic inflammations of the lids and globe.

DISCUSSION.

CORREA DE BARROS (Oporto) uses a hot-air apparatus in the treatment of trachoma and is pleased with its effects.

9. TOMLINSON (London): **A new perimeter** (author's abstract).

Tomlinson exhibited a self-registering perimeter in which the usual quadrant is not used. On looking through it one sees a double image of a mark, in consequence of refraction of the light through a prism, or reflection by means of a mirror. The second image may be moved outward from 0° to 35° by means of the prism, from 0° to 75° by means of the mirror. An indicator moves over a chart attached to the table in correspondence with the position of the second image on the retina and marks out the field.

FOURTH DAY. TUESDAY, APRIL 24, F. MEYER, LISBON,
PRESIDING.

10. WIECHERKIEWICZ: **Further experience in the use of pyoctanin in ophthalmic treatment** (author's abstract).

Wicherkiewicz has used pyoctanin in various forms of infectious corneal ulcers for several years, and has found its effect greatly increased by the use of dionin immediately after its application. Dionin renders the penetration of the pyoctanin into the tissue easier by the lymph stasis it occasions. He has found pyoctanin a very effective remedy, not only in corneal ulcers and infected wounds of the eye, but also in dacryocystitis, orbital phlegmons, and empyemas of the accessory sinuses. He first washes out the suppurating cavity with hydrogen peroxide until the injected fluid returns more or less clear. He obtained a brilliant result in a case of severe mucocele of the frontal sinus by aspiration of the contents of the sinus, followed by the injection of several drops of a $\frac{1}{2}$ per cent. solution of pyoctanin. There was a perfect cure of the exophthalmos, the lateral deviation, the flattening of the eyeball, and the detachment of the retina within

fourteen days. On the same principle rests the bloodless treatment of various cysts, like those of Moll's glands.

DISCUSSION.

XAVIER DA COSTA (Lisbon) has used pyoctanin in trachomatous ulcers of the cornea, but has found the application very painful and has not obtained the desired results when no other treatment was employed.

CABANNES: Pyoctanin should not be used in acute dacryocystitis, because it is too irritating, but it might be useful in chronic cases if they could be observed long enough to determine the permanency of the results.

WICHERKIEWICZ said, in conclusion, that he did not use pyoctanin in acute dacryocystitis, but relied on antiphlogistic measures. He used it only in chronic cases, particularly of empyema and blennorrhœa of the lachrymal sac. He considered it better, from the standpoint of conservative surgery, than the destruction or extirpation of the sac. If it falls, then extirpation is indicated.

11. NEVES DA ROCHA: **Traumatic strabismus.**

12. M. MASCARO: **Education of the blind.**

13. M. FARINA: **Rapid treatment of syphilitic choroiditis and chorio-irido-cyclitis.**

14. M. SUAREZ DE MENDOZA (Paris): **Advantages of the corneal suture in cataract operations.**

Mendoza reported 215 cases of **corneal suture** with only two bad results. He is very much pleased with the results obtained.

15. F. OSTWALD (Paris): **Deep injections of cocainized alcohol in facial and other forms of neuralgia** (author's abstract).

Ostwald reported the results he had obtained from these injections in sixty cases of facial neuralgia, sciatica, neuralgia of the crural and ulnar nerves, of a nerve of the finger, of the cervical plexus, etc. Nine cases of facial hemispasm, which had lasted for years, were cured by injections of alcohol and stovain (80 per cent. with 0.01 stovain per dose) in the region of the stylo-mastoid foramen.

He demonstrated on a skull and with an anatomical preparation of a head how he made his injections at the exit of the three branches of the trigeminus from the base of the skull.

SYSTEMATIC REPORT ON THE PROGRESS OF OPHTHALMOLOGY IN THE SECOND QUAR- TER OF THE YEAR 1905.

By Dr. G. ABELSDORFF, in Berlin ; Prof. ST. BERNHEIMER, in Innsbruck ; Dr. O. BRECHT, Prof. R. GREFF, Prof. C. HORTSMANN, and Dr. R. SCHWEIGGER, in Berlin ; with the Assistance of Prof. A. ALLING, New Haven ; Prof. E. BERGER, Paris ; Prof. CIRINCIONE, Genoa ; Dr. DALÉN, Stockholm ; Prof. HIRSCHMANN, Charcow ; Dr. J. JITTA, Amsterdam ; Mr. C. DEVEREUX MARSHALL, London ; Dr. H. MEYER, Bradenburg ; Dr. P. VON MITTELSTÄDT, Metz ; Dr. H. SCHULZ, Berlin ; Prof. DA GAMA PINTO, Lisbon ; and others.

Translated by Dr. PERCY FRIDENBERG, New York.

Sections I.—III. Reviewed by PROF. C. HORSTMANN,
Berlin.

I.—GENERAL OPHTHALMOLOGICAL LITERATURE

295. HIRSCHBERG, J. **History of Ophthalmology.** *Graefe-Sæmisch, Handbuch der Augenheilkunde*, 2d edition, vol. xiii., chap. xxiii.

296. HIRSCHBERG, J., LIPPERT, J. AND MITTWOCH, E. Amnaar B. Ali Al Mansili, *The Book of Choice in Eye-Diseases*. Salah Ad-Din, *Light of the Eyes*, etc. Translated and elucidated from Arabic manuscripts. Leipsic 1905.

297. MANDELSTAMM, M. E. **History of ophthalmology in the second half of the last and the beginning of the present century.** *Westn. Ophthalm.*, 1905, No. 3.

298. HORSTMANN, C. *History of Ophthalmology.* *Handbook of History of Medicine*, vol. iii. Jena, 1905.

299. DU BOIS REYMOND, CLAUDE. *Contribution to the History of Lenses.* Festschrift for Julius Hirschberg. Leipsic, 1905.

300. FUKALA, CH. **Trachoma in Cicero, Pliny, and Horace.** *Zeitschr. f. Augenh.*, vol. lxiii., p. 28.

301. WEGEHAUPT. In regard to the preceding article by Dr. Charles Fukala. *Ibid.*, p. 55.

302. MAGNUS, H. **Were Cicero, Pliny, and Horace affected with trachoma ?** *Ibid.*, vol. 64, p. 63.

303. FUKALA, CH. Answer to Dr. Wegehaupt's remarks on trachoma in Cicero, etc. *Ibid.*
305. BERGER, EMIL. On the influence of anomalies and diseases of the eye on the technique of painting. *Muench. Kunst-techn. Blaetter*, 1905, 13-16.
306. SNELLEN, H., JR. Ophthalmic therapeutics. *Graefe-Saemisch*, 2d ed., pt. ii., chap. iii., vol. viii., iv.
307. NAGEL, W. *Textbook of Human Physiology*, vol. iv. Physiology of the muscular and nervous systems. Brunswick, 1905.
308. MANSILLA, S. GARCIA. *Elementary Treatise on Ophthalmology*. Madrid, 1905.
309. LAGRANGE, F., and VALUDE, E. *French Encyclopædia of Ophthalmology*, vol. iv. *The Relation of Eye-Diseases to Ocular Pathology. Ocular Symptomatology. General diseases of the Eye*. Paris, 1905.
310. COHN, H. Recollections of observations on school-hygiene made in co-operation with Prof. v. Mikulicz. *Wochensch. f. Hyg. u. Ther. d. Aug.*, 1905, 40.
311. DOMITROWICH. The hygienist and the school bench. *Arch. f. Schul-Hyg.*, 1905, No. 1.
312. REICHENBACH, H. The question of measurement of daylight. *Klin. Jahrb.*, vol. xiv., 1905.
313. SPEIDEL, K. The eyes of theological students in Tuebingen. *Inaug.-Diss.*, 1905, Tuebingen.
314. SCHLEICH. The eyes of Tuebingen school girls and boys. *Arch. f. Schul-Hyg.*, 1905, No. 1.
315. KOPPE. On school examinations and school statistics. *Petersb. med. Wochenschr.*, 1905, p. 291.
316. AUGSTEIN. Practical examinations in color blindness to determine fitness for railway service. *Aerztl. Sachverst. Zeitg.*, 1905, No. 5.
317. BEYKOWSKI. *Determination of vision and refraction for military surgeons*. Vienna, 1905.
318. RUEHLMANN. The causes of blindness. *Inaug.-Diss.*, Halle, 1905.
319. SALZER. What is to be taught by the last Bavarian statistics of blindness? *Muench. med. Wochenschr.*, 1905, p. 1335.
320. KORTE. On damages for accidental injuries of the eye in the building trades. *Inaug.-Diss.*, Freiburg, 1905.
321. LANDOLT, E. Uniformity in determination of visual acuteness. *Zeitsch. f. Augenh.*, xii., p. 510.
322. GULLSTRAND, A. The ophthalmoscopic clinic in Upsala. *Upsala Laekarep. Foerhandl.*, 1905, vol. v., p. 288.
323. TROUSSEAU, A. *The Ophthalmic Institute Founded by Adolphe de Rothschild*. Paris, 1905.
324. TRUC, H. *The Ophthalmic Clinic at Montpellier since its Foundation 1887-1904*. Montpellier, 1905.
325. v. GROSS, E. *The Work of the Buda-Pesth University Eye-Clinic in 1904*. Szemezset, 1905, No. 1.
326. PAGENstecher, H. *Forty-Ninth Report of the Wiesbaden Eye Infirmary for the Poor*. Wiesbaden, 1905.

327. SNELLEN, H. *The Netherlands Eye Infirmary for the Poor.* Utrecht, 1905.

HIRSCHBERG (295, History of ophthalmology) deserves credit for being the first to give a complete survey of Arabic ophthalmology. The task was particularly difficult, as there were no printed documents as there are in the case of Greek authors, but only manuscripts in Arabic, Persian, and Hebrew, lying in forgotten corners of various libraries. These were found and collected by Hirschberg in Cairo, Constantinople, Florence, Parma, Paris, the Escorial, Leyden, Oxford, Munich, Tuebingen, Gotha, Dresden, and Berlin, and translated into German. Hirschberg shows what remarkable progress the Arabs had made in those days, and disproves the assertion of Hirsch that their science was based on that of the Greeks and contributed nothing to the progress of this branch of medicine. The Arabs actually fostered medical science in all parts of Islam at a time when there was much obscurity in the European Occident.

The work of HIRSCHBERG, LIPPERT, and MITTWOCH (296, The book of choice in eye-diseases, etc.) contains the German translation of a hitherto unknown manuscript, *The Choice of Eye-Diseases of Ammar B. Ali in Mosul*, dating from about 1000. Ammar was the most gifted and probably the most capable of Arabian eye-physicians. *The Book of the Satisfactory in Ophthalmology*, by Halifa B. Abil-Mahazin, was written not long after 1256. The manuscript is in Constantinople. The book entitled *Light of the Eyes*, by Salah Ad-Din, is one of the most comprehensive of Arabian works on diseases of the eye. The author is otherwise unknown. The work was probably written about 1296.

The work of HORSTMANN (298, History of ophthalmology) is essentially one for the general practitioner, giving a general sort of bird's-eye view of the History of Ophthalmology. Most of the data previous to the nineteenth century are taken from the excellent work of August Hirsch. The final section contains a review of the progress of ophthalmology in the latter half of the nineteenth century.

Du Bois REYMOND (299, Contribution to the history of lenses) describes three antique window-glasses from the Antique Room of the Berlin Museum, which are thicker at the middle than at the margin, so that they are really convex lenses. As these pieces date from an early Roman period they show that at this

time they were able not only to manufacture glass but also to produce an optical effect. It is a question whether the latter was intentional.

FUKALA (300, Trachoma in Cicero, Pliny, and Horace) attempts to prove from the Latin classics that trachoma was widely spread among all classes of the Roman populace, and that Cicero, Horace, and the younger Pliny were affected with this disease.

WEGEHAUPT (301, In regard to the preceding article by Dr. Charles Fukala) shows that the above-mentioned conclusions of Fukala are without philologic basis, as the word "lippitudo" certainly did not mean trachoma.

According to MAGNUS (302, Were Cicero, Pliny, and Horace affected with trachoma?) there is no medical basis for the belief that Cicero, Horace, and Pliny were affected with trachoma, as the word "lippitudo" does not mean trachoma, but is used to indicate an affection of the eyes depending on a pathologic change in the fluid contents of the globe.

BERGER (305, On the influence of anomalies and diseases of the eye on the technique of painting) gives a broad sketch of the effect of anomalies and diseases of the eye on the products of the painter's art. He discusses anomalies of refraction, particularly astigmatism, which affected a number of painters, notably Turner, whose trees are all drawn out to an unnatural length. In many painters color perception was poorly developed, and senile changes in the lens also had an influence on the painter's manner. Loss of an eye caused a defective appreciation of relief, which is evident in the paintings of such artists.

SNELLEN, Jr. (306, Ophthalmic therapeutics), in his work discusses, first, antiseptics, and then astringents. To these he opposes the relaxants or irritants, the most important of which are calomel and the yellow precipitate of mercury. The principal anæsthetic and analgesic is cocain, for which holocain, eucain, tropo-cocain, and arcoïn may serve as succedanea. Atropin is the most important mydriatic; the alkaloids of the calabar bean, eserin and physostigmin, the best myotics.

The first half of the fourth volume of NAGEL (307, Textbook of human physiology) contains a treatise by A. Tschermak, on the physiology of the brain. Special chapters are devoted to the visual disturbances following lesions of the parieto-

occipital lobe, the visual sphere, and the sigmoid gyrus. Under localization of the sensory and motor functions, we find the representation of the eye muscles and the visual sphere, the localization of visual concepts, and psychical blindness.

O. Langendorff presents the physiology of the spinal cord and medulla, considering, in its relation to the various organs, the secretion of tears and the centres for lid-closure and pupillary action. In P. Schulz's chapter on the sympathetic system, the relation of the cervical sympathetic to the eye is considered.

The handbook of ophthalmology of MANSILLA (308, Elementary treatise on ophthalmology), Professor in the Medical Faculty of Madrid, will be greeted with pleasure as evidence that his subject is being taught in Spain in a way befitting the modern standard. The general plan of the work is rather unusual, as he first treats of the anatomy of the eye and its adnexa, then of physiology, physiologic optics, examination of the patient, and determination of refraction. We then come to the clinical part: Diseases of the lids, conjunctiva, lachrymal apparatus, muscles, orbit, and finally those of the globe, cornea, sclera, etc. In each section the operations are detailed, with indications and technique. German ophthalmology has been thoroughly studied by the author. In discussing glaucoma and sympathetic affections of the eye, the various theories are considered without a final decision for any one view. The book contains reports of a number of rare cases seen by the author, as a case of anophthalmus, with autopsy. The numerous illustrations, most of them well reproduced, are worthy of notice.

BERGER.

Volume IV. of the *French Encyclopædia of Ophthalmology* edited by LAGRANGE and VALUDE (309) contains the following articles:

Emile Berger treats of the relations of eye-diseases to systemic affections, a subject which he has already discussed in a large work. The present treatise is more succinct, and follows rather closely the views held by French clinicians. Diseases of metabolism, for instance, are considered, with Bouchard, as due to "*Ralentissement de la nutrition*," and much more stress is laid on auto-intoxication than is the custom, say, in Germany, although the author takes pains to present both sides of the question where the views of authors in these two countries are at variance. Diseases of the nervous system and those of infectious nature in

their relation to ocular affections are considered at length. Among the more recent observations we may mention those on disturbances of reading in tabes and of relief-perception in hysteria.

Morax. Examination of the patient. Symptomatology of eye-disease. The work of this author on the same subject, in co-operation with Brun, has already been reviewed in these ARCHIVES.

Rohmer, General diseases of the eye. The title of this section does not correspond to the contents, which treats in detail of injuries of the eye. Etiology, symptomatology, diagnosis, prognosis, prophylaxis, and treatment of traumatic affections are discussed in their general bearings. Special chapters are then devoted to foreign bodies, changes of position of the globe in consequence of mechanical violence, dislocation, avulsion of the globe, exophthalmus. This is followed by a chapter on injuries by blunt force, concussion and contusion of the globe, incised and contused wounds, and so on. The following section is devoted to burns by chemical and thermic agents and to electrical injuries. Particular attention is paid in the last chapter to the injuries of the eye in war. The history of this important topic is presented in full, and a tribute paid to Percy and the elder Larrey. We then come to the work of Bertheraud (1850) and the experiences of the Crimean campaign of Chenu (1869), who also collated the statistics of the Franco-Prussian war. The reports of the German Sanitary Commission are drawn upon largely for material as to injuries of the eye. Among other works dealing with this subject we may mention Legoucet (1872), Neudoerfer (1872), Chauvel and Nemier (1890), and Delorme (1893). Rohmer's remarks on sympathetic ophthalmia, hemianopsia, and operative procedures in military ophthalmology will be read with particular interest. The author's command of the literature of the subject, especially that of German authors, is worthy of great praise.

BERGER.

COHN (310, Recollections of observations on school hygiene) reports his investigations, carried out in collaboration with Mikulicz, on vertical writing and its influence on posture. He concludes that the carriage of the body and attitude during writing are markedly affected by the factor mentioned.

REICHENBACH (312, The question of measurement of day-

light) claims that an accurate determination of the angle of latitude is not of paramount importance in the measurement of the illumination of interiors. It is generally sufficient to determine the angle of aperture and elevation with Gotschlich's mirror instead of the complicated measurement of the spatial angle mentioned above.

SPEIDEL (313, The eyes of theological students in Tuebingen) examined, in all, 566 students and 1132 eyes. Of these 310 were Catholics and 256 Protestants (Lutherans). Among the former there were 373 myopes and 83 hypermetropes; among the latter, 330 myopes and 72 hypermetropes. The lowest degrees of myopia are most common; middling degrees less common, and myopia above 10 D. quite exceptional. Of a total of 702 myopic eyes, 521, *i. e.*, 72 %, had a crescent, which was rarely missing in myopia of 9 D. and over. Absence of the crescent was noted generally in low degrees of myopia and in these cases vision was comparatively most acute. The myopia was complicated in 140 cases. In 141, *i. e.*, 37 %, of the cases, either the father or mother or both were myopic. There were no striking differences of cranial configuration to be noted as between emmetropes, myopes, and hypermetropes, and similarly there was no evident relation between the refraction and complexion (coloring) of the eyes.

AUGSTEIN (316, Practical examinations in color blindness to determine fitness for railway service) recommends the use of the tissue-paper contrast with Cohn's tables, to be followed by the tests of Holmgren, Stilling, and Nagel, in the examination of railway employees.

The work of BEYKOVSKY (317, Determination of vision and refraction for military surgeons) gives a short compend of the examination of the eye, paying particular attention to the subject of simulation and its detection which is of special importance for the military surgeon.

RUEHLMANN (318, The causes of blindness) considers as blind those whose vision has sunk to the counting of fingers at one half of one meter, at most. His cases, collected from the university eye-clinic, the polyclinic, and various institutions for the blind in Halle, were 265 bilateral, and 1032 unilateral blind. The cause of blindness was: disease of the cornea, 209; optic nerve atrophy, 117; iridocyclitis, 62; glaucoma, 67; cataract, 64; injury, 396;

gonorrhœal ophthalmia, 152; infectious disease, 40; detachment of the retina, 47.

SALZER (319, What is to be taught by the last Bavarian statistics of blindness?) calls attention to the statistics of blindness based on the last Bavarian census of 1900. Of all cases of blindness, 8 % were due to gonorrhœal ophthalmia, about 13 % to injuries, 1 % to measles, and 0.65 % to small-pox.

KORTE (320, On damages for accidental injuries of the eye in the building trades) claims that loss of one eye does not, as a general thing, incapacitate for work in the building trades. Many laborers will, however, take a long time to accustom themselves to the new order of things, and others, like the roofers, will not dare to pursue their hazardous calling on account of the feeling of insecurity. Loss of one eye should always entitle to a permanent annuity, as these workmen, in spite of their skill and usefulness, are hampered by difficulty in getting employment. Those who have an approximately normal eye on one side and are aphakial on the other are able to fill their places in the building trades.

LANDOLT (321, Uniformity in determination of visual acuteness) recommends, as test-objects for the determination of vision, interrupted lines in the form of a C, bent in a circle.

The article of TRUC (324, The ophthalmic clinic in Upsala) contains a detailed account of the Montpellier clinic which was founded in 1887, and has supplied material for a series of excellent scientific publications by Truc, his assistants, and pupils. The number of out-patients, was 24,160; of in-patients, 4894; 4453 operations, including 1528 for cataract were performed. Wax specimens are largely used for demonstration in teaching anatomy, embryology, and pathology of the eye (Tramont et Jumelin, Paris). In the historical introduction, Truc gives an interesting account of the first chair of ophthalmology established in France, which was founded at Montpellier in 1788, but abandoned in 1792, as the medical faculty of Montpellier was closed during the Revolution. When it was re-established in 1794, the former professor of ophthalmology, Seneau, was appointed to the chair of midwifery, but there was no special teacher for ophthalmology.

BERGER.

In the Wiesbaden Eye Infirmary, PAGENSTECHE (326, Forty-ninth report of the Wiesbaden eye infirmary for the poor) treated

3077 cases in 1904. There were 89 cataract extractions, all successful but one; 45 squint operations, and 22 iridectomies.

In the Utrecht Eye Hospital (327, The Netherlands eye infirmary for the poor), 7289 cases of eye disease were treated and 63 extractions for cataract performed during the year 1904.

II.—GENERAL PATHOLOGY, DIAGNOSIS, AND THERAPEUTICS.

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333. WOLFF, B. Eye injuries during birth. *Ibid.*
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371. LOHNSTEIN. On a modification of the reversed image and its application to determination of refraction. *Zeitschr. f. Augenh.*, xiv., 2, 148.
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SCHIECK'S (329, As to the iron-reaction in melano-sarcoma of the choroid) investigations go to show that the frequently noted iron-reaction in the pigment of melano-sarcoma of the uveal tract cannot be considered as proof of a hæmatogenous origin, as it depends on a degeneration of the chromatophores or on the transportation of pigment-cells. A disseminated iron-reaction can accordingly be considered no more characteristic of hæmatogenous pigmentation than the form and color of the pigment, the arrangement of the pigment-cells around the vessels, and the irregular distribution of the pigment-cells in the tumor.

SCHEIN (330, On excessive pigmentation in the human eye) reports 3 cases of *anomalous pigmentation* of the *sclera*, *iris*, *conjunctiva*, and *choroid*, and one of conjunctival pigmentation. In the latter case, a triangular, raised pigment-patch was seen, 3mm below the limbus, and composed of black spots, some of which were confluent.

BIRNBACHER (331, On the causes of increased tension in intra-ocular tumor-formation) examined 8 cases of *intraocular tumor-formation* in an early stage, but with evident *increase of tension*. In 7 cases the iris-angle was narrowed or occluded; in one case the lumen of a vorticos vein was completely plugged with tumor-cells. Thus there are various causes for plus tension in these cases. Obstructions in the lymph-channels or the efferent blood-vessels may be a factor, which is generally due to changes at the iris-angle or to obstruction of the efferent vein by tumor-masses.

PURTSCHER (332, On the prognosis in injuries of the eye by blunt force, especially by horn-thrust) observed 74 cases of eye injuries by blunt violence. Of these, 26 were ruptures of the sclera by thrust with a cow's horn, 36 of the same lesion due to other causes, 12 in which the thrust of the cow's horn had produced extensive injury without bursting the sclera. In almost two-thirds of the cases useful vision was obtained, and in 11 cases enucleation was performed. Sympathetic ophthalmia did not occur. Purtscher advises immediate enucleation in extensive crushing of the globe, but this procedure may be postponed in case of open scleral rupture without extensive loss of vitreous.

WOLFF (333, Eye injuries during birth) reports 4 cases of eye injuries in new-born children, observed in a series of 581

confinements in narrowed pelves. A review of the literature of this subject is also given. The least serious accidents are retinal hemorrhages due to asphyxiation. As birth-injuries in a narrower sense we have fractures of the orbital wall, injuries of the neighboring soft parts, protrusion and avulsion of the globe, exophthalmus, ocular paralysis, contusion of the globe, corneal opacity, hemorrhage into the anterior chamber, rupture of the choroid, optic nerve atrophy, infantile glaucoma, traumatic cataract, panophthalmitis, phthisis bulbi, and microphthalmus. The eye injuries were rarely seen in cases of after-coming head, but were most frequent in forceps cases in narrow pelves.

SCHULZE (335, Inoculation of rabbits' eyes with syphilitic virus) experimented on rabbits by opening the anterior chamber, wounding the iris with the point of a lance-knife, and inoculating the wound with syphilitic virus. This consisted of matter from a chancre emulsified with glycerin and water and rubbed in with a narrow spatula. Kidney tissue of one of the inoculated rabbits, containing cytorrhyses luis, was then introduced into the eye of another, *i. e.*, from one animal to the other. Finally an animal was inoculated with the blood of a human being in the florid stage of syphilis. After the primary injection caused by the operation had subsided, a second reaction was noted within three or four days, more marked in the vicinity of the point of inoculation. The cornea became cloudy, and there was a localized opacity of the iris. The injection then paled again, while the corneal opacity became circumscribed, remaining to a certain degree. The iris soon showed a discoloration and diffuse thickening at the point of inoculation. The general reaction of the globe gradually became less, and the disease became localized in the form of a yellowish-gray discoloration at the point of inoculation. Multiple nodules were frequently seen. Microscopic examination invariably showed cytorrhyses luis in the iris.

In a study of moulds and their action on the eye, BUCHANAN (336, Mycoses, with special reference to mycosis of the eyeball) found 21 cases reported in literature, 14 in Germany, 2 in Scotland, 2 in North America, 1 each in Russia, France, and Italy. Only a few moulds are pathogenic for the human eye. These are *aspergillus fumigatus*, *nigricans*, *flavescens*, and *glaucus*, and *penicillium glaucum*. The first is the most common. The cornea is most frequently the seat of disease, although hyphomycetæ may occasionally reach the interior of the eye. The

infection generally appears in the form of hypopyon keratitis ; the margin of the ulcer is sharply defined, and slightly raised above the level of the neighboring cornea. The latter is cloudy and gray, and may remain so for weeks or months. Hypopyon is almost invariably present. Pain is a noticeable feature, but there is little tendency to spread. The best treatment is the destruction of the affected part. Cultures will grow on any medium at a temperature of 37. 5 C. The specimens are best stained with Ehrlich's hæmatoxylin.

POLATTI (337, Experimental studies on panophthalmitis due to the bacillus subtilis) inoculated the anterior chamber and vitreous of rabbits with pure cultures of the bacillus subtilis and with earth and other foreign matter infected with this micro-organism. He concludes that there is no doubt as to the pathogenic action of the bacillus subtilis which may enter the vitreous, and there finds an excellent culture medium. As this germ is extremely widespread in nature, we must be prepared to find a specific panophthalmia due to its agency in a large number of cases. CIRINCIONE.

HOERING (338, Notes on the relation of systemic disease to affections of the eye) gives a short sketch of the relation of systemic diseases to affections of the eye, without presenting anything strikingly new.

HILBERT (339, On the subjective perception of colored spots in the visual field as a pathological and physiological occurrence) makes a distinction between pathological sensations of color of a subjective nature which occupy the entire field of vision, and those in which the color is perceived in the form of more or less sharply circumscribed spots. Hilbert observed two cases of the latter form. In the case of a girl of sixteen, after influenza, there appeared before the right eye a bluish-green spot which disappeared after eight or ten days. A man of fifty-three had occasional sensations of a brown spot in front of the left eye, which came and went. The author has no explanation to offer for this phenomenon.

ROTHHOLZ (341, Scrofulous ophthalmia) is of the opinion that a series of eye diseases which have been called scrofulous are to be considered as tuberculous. On the other hand, many characteristic symptoms of scrofula are the results of suppuration in the nasal and accessory cavities. The latter should always be borne in mind in the treatment of so-called scrofulous eye-disease.

JEAN GALEZOWSKI'S (342, The fundus oculi in affections of the nervous system) work on the fundus oculi in diseases of the central nervous system is based on material from his father's clinic and that of Professor Raymond (Salpêtrière). The clinical symptoms are discussed with the ophthalmoscopic finding. The literature on the subject is very completely presented.

In regard to tabes, Galezowski agrees with his father that mercurial treatment is of value in the accompanying optic-nerve atrophy, and that syphilis plays the most important ætiologic rôle. Of sixty-four cases of atrophy in tabics, a history of preceding syphilis was obtained in forty-nine. Separate chapters are devoted to the affections of the optic nerve in multiple sclerosis, acute myelitis, and progressive paralysis. These are followed by a discussion of the eye-ground in softening of the brain, tumor, tuberculous meningitis, and cerebro-spinal meningitis. Finally, the general neuroses are considered, which, as is well known, show no changes in the fundus. In one case, however, Galezowski observed bilateral pallor of the nerve-head in hysteria, an exceedingly rare occurrence, of which, so far, only two instances have been reported, one by Léber, and the other by Galezowski (senior) from Charcot's clinic. The most important fundus-changes are shown in fourteen colored plates.

BERGER.

GROYER (343, Eye-disease and gastro-intestinal auto-intoxication) believes that many cases of eye-disease in which there is no apparent cause to be determined from the previous history are due to disorders of digestion. He was able to find indican in the urine with few exceptions. As this reaction is only present when there are processes of decomposition in the intestine, Groyer concludes that in the digestive tract of these patients toxic substances form which may cause disease of various organs of the body, notably of the eye.

According to BEST (344, Local anæsthesia in ophthalmic therapy), the instillation of the usual anæsthetics into the eye is entirely harmless as far as any danger of systemic intoxication is concerned. Corneal opacity is only to be feared when unusually large quantities have been employed. Cocaine, particularly in combination with adrenalin, is by far the best local anæsthetic.

After instillation of a 4 % solution of cocaine, GUTTMANN (345, Report of a new method of applying anæsthesia in opera-

tions on the globe, and lids, with special reference to operations for trachoma) washes the skin of the lids with water and soap. He then injects a solution of sodium chloride 0.2, cocaine muriate 0.05, to water 100, into the subconjunctival tissue near the edge of the upper cartilage.

URATA (346, Experimental investigation as to the value of the Credé drops) finds the bactericidal action of 1 % silver acetate weaker than that of 1 % silver nitrate. The irritation is about the same in both. Silver nitrate works most energetically on staphylococci, less so on streptococci, pneumococci, and gonococci.

The specific treatment of serpent ulcer, instituted by ROEMER (347, The serum-therapy of serpent ulcer. The combination of active and passive pneumococcus-immunization) is still being developed, and is far from complete. The first stage of the serum-therapy was occupied with clinical experiments to determine whether the use of the serum alone was sufficient for a cure. As this was found not to be the case, Roemer determined to use the combined method with active immunization. Numerous experiments on animals were made to determine the time in which the organism reacts to dead cultures of pneumococcus by the production of specific alexins. As the bactericidal action of pneumococcus serum cannot be accurately determined, Roemer made use of the agglutination phenomenon, which is much more easily demonstrated, to find the rapidity of production of the antibodies. After forty-eight hours, specific agglutinins have already been formed. The pneumococcus antibodies are formed in the internal blood-forming organs. The results of these investigations, from the standpoint of Ehrlich's side-chain theory, leads us to hope for practical results in active immunization after infection with pneumococcus. This procedure is the more important as the immunizing serum, as shown by Roemer, is eliminated from the body, to a great extent, in the course of a few hours. It is shown that the dead cultures of pneumococcus are absolutely harmless. The first practical experiments on the basis of these data were made with material from the Wuerzburg clinic. In a series of cases there was undoubtedly some effect of the serum-therapy.

SCHWARTZ (350, Cure of a case of ocular tuberculosis with Marmorek's serum) describes a case of tuberculous inflammation

of the conjunctiva in a girl of sixteen, which looked exactly like granular conjunctivitis. The bacteriological ætiology was confirmed by microscopic examination of excised tissue and inoculation tests. Marmorek's serum was then injected under the skin of the abdomen, 276ccm being given altogether. Complete cure then followed.

DIEHL (351, Further experiences with the intraocular administration of iodoform) reports 14 cases of intraocular administration of iodoform. Of these 11 were serpent ulcers, 9 injuries, 3 perforating wounds, and in 2 there was no evident external cause. The results were good except in the two cases of perforative injury, in which the eye had to be enucleated. The introduction of iodoform into the anterior chamber gives uniformly good results, but as to its use in the vitreous the question has not been decided.

In corneal abscess following injury, SILEX (353, Treatment of infected wounds of the globe) first pays attention to the lachrymal sac, which is promptly extirpated if dacryocystitis is present. In case of beginning sepsis after scleral perforation, the actual cautery is carried deep into the vitreous, in order, if possible, to destroy the infiltrated tract. Perforating corneal wounds, with iris prolapse and injury of the lens, are treated by excision of the prolapse, evacuation of lens-masses, and cauterization of the wound edges in certain cases. In addition, subconjunctival injections of bichloride or oxycyanate of mercury are recommended.

HIRSCHBERG (354, The prevention of suppuration of the globe from scars of incisions) reports two cases of intraocular suppuration from infection of the corneal section after scar had formed. Cauterization with an incandescent platinum point checked the process.

KOEHLER (355, The action of newer disinfectants, particularly oxycyanate of mercury, on infected instruments) recommends oxycyanate of mercury for the cleansing and disinfection of contaminated instruments.

HOTTA (356, Experimental investigations on the infection of corneal wounds by saliva) experimented on rabbits, cats, and mice, producing artificial injuries in the form of erosions, pockets, and penetrating wounds. Saliva taken from individuals of different ages and social standing was then rubbed into the wound with a

spatula. In thirty cases of perforating wound the result was negative; positive but once in thirty erosions, and uniformly positive in wounds with pockets.

GRUBE (357, Comparative investigations on the action of atropin, homatropin, and eumydrin on the eye) found that the pupil dilated $\frac{1}{2}$ mm in 6 minutes, on an average, after homatropin; in 10 minutes, after atropin and eumydrin 5%, and in $12\frac{1}{2}$ minutes after 1% eumydrin. The increase to maximum dilatation took place most rapidly after 5% eumydrin, in 28 minutes, average time; almost as quickly after atropin, and in 31 minutes after homatropin, and in 51 minutes after 1% eumydrin. Complete mydriasis lasted longest with atropin, 26 hours, average time; 16 to 20 hours after eumydrin, 5%; $17\frac{1}{2}$ hours with 1% eumydrin, and 3 to 4 hours after homatropin. The action of atropin lasted 5-7 days; that of 5% eumydrin, 78 hours; of 1% eumydrin, 60 hours; of homatropin, 26 hours. Accommodation was completely paralyzed in every case by atropin and 5% eumydrin, but in only a few by 1% eumydrin and homatropin.

BORNEMANN (358, Blindness following injection of atoxilin for lichen ruber) observed marked weakness of sight after injections of 20% solutions of atoxilin for lichen ruber. There was concentric contraction of the visual field, and pallor of the temporal half of the nerve-head. This gradually went on to white atrophy and complete loss of sight.

BECK (359, Subconjunctival salt injections) reports 34 cases in which he made subconjunctival injections of salt-solution varying in strength from 1% to 10%. In 8 cases of vitreous-opacity, 7 showed improvement; of 14 cases of central choroiditis, 10 were improved and but 1 got worse; of 12 cases of detachment of the retina, 6 were benefited.

The investigations of BIRCH-HIRSCHFELD and INOUE (360, Experimental studies on the pathogenesis of thyroidin-amblyopia) show that progressive feeding of dogs with thyroidin, beginning with small doses and gradually increasing to 8-10 gm per diem, causes symptoms of optic nerve atrophy. This develops in the course of several months, and is not preceded by any evidence of vascular changes in the retina or disc. Histologic examination showed chromatolysis of the ganglion cells of the retina, shrinkage of the nucleus, and disintegration of the cell.

There was no evident predisposition as to location of these changes in any particular region of the retina. Comparatively well-preserved ganglion cells were always found next to those which had degenerated. The nerve presented a picture of partial diffuse degeneration of the fibres, becoming less marked centripetally, without changes in the glia, connective-tissue, septa, or vessels. Thyroidin-amblyopia in man is closely allied clinically to chronic alcohol-tobacco amblyopia, according to the reports of Coppez and Aalberstberg. It is not a result of interstitial neuritis, but due to primary lesion of the ganglion cells and secondary degeneration of the nerve.

WEINHARDT (361, Clinical statistics of 1122 enucleations) finds records of 1122 enucleations performed at the Tuebingen University eye-clinic from its foundation until 1904. The operation was indicated by malignant new growths in 84 cases; papilloma corneæ, 1 case; angioma of the choroid and cysticercus, each 1 case; hydrophthalmus, 20 cases; absolute glaucoma, 86 cases; intraocular hemorrhage, 6 cases; injuries, 671 cases; panophthalmitis, 6; secondary glaucoma, 65; iridocyclitis, 61; staphyloma, 67; phthisis bulbi, 48; exophthalmic goitre, 2; lagophthalmus, 1; and keratomalacia, 2 cases.

Regeneration of the ciliary nerves may occur, according to BIETTI (363, Experimental investigations on the regeneration of the optic nerve after optico-ciliary resection), after optico-ciliary resection. It may be partial or complete, and is occasionally wanting. The nerve may be regenerated in its entire length after being cut off. The ciliary ganglion was invariably preserved, with slight changes or none.

CIRINCIONE.

BOLOGNESI (364, The injection of melted paraffin into the tissues of the eye) was unable to find any phagocytic action by the organism on paraffin which had been introduced into the tissues of the eye or any local chemical action of the paraffin. There was no embolic action, and the effect was due essentially to local mechanical action on the elements with which the paraffin came in contact.

CIRINCIONE.

HAAB (365, On the correct use of the giant magnet) discusses the most appropriate methods of removing metallic foreign bodies from the eye, and gives a detailed description of his giant magnet. He considers it important for the operator to be

able to make and break the current instantly by pressure on a pedal. A stationary magnet is to be preferred, as it is manifestly easier to move the head and eye of the patient than a mass of metal weighing upwards of 200 pounds. Great caution should be exercised to avoid drawing the foreign body into the ciliary region. Dilatation of the pupil facilitates drawing a small foreign body out into the anterior chamber. If the patient's head be brought into the right position it is often possible to bring the foreign body free into the anterior chamber. It can then be extracted through a small incision by means of the small magnet, or, as Haab prefers, with his own. Iridectomy should be avoided, if possible; Haab has never found it necessary. In case the eye is very much irritated, a small rod of iodoform is introduced into the anterior chamber. To avoid injury of the vitreous, he advises removal of the foreign body through the anterior chamber, instead of making a fresh opening in the sclera and so causing complications. In case extraction has failed with the giant magnet, it is useless to attempt it with the small magnet, especially when the location of the foreign body is in doubt.

DEVEREUX MARSHALL.

According to HELBRON (366, Kroenlein's operation), the preservation of the globe, whether blind or still capable of seeing, in case of retro-ocular disease, is permissible only when this is consistent with the removal of the focus of disease. In decidedly malignant tumors, especially in early life, prompt exenteration is the surest safeguard against recurrence. In case the disease focus is far forward and well defined, simple extirpation from in front is to be preferred to the temporary resection of the outer orbital wall as the simpler procedure. Kroenlein's operation itself is a technically simple procedure, devoid of danger, which permits of the preservation of the eye and generally of vision, but which often leaves more or less marked muscular disturbance behind. It is indicated in all deep-seated affections of the orbit which are not of markedly malignant character, especially when located in the temporal half, while those toward the nasal half are not usually exposed sufficiently. According to previous experience, the operation is indicated in cysts, cavernoma, large tumors of the lachrymal gland, solid orbital tumors of slow growth, all tumors of the optic nerve and sheaths, foreign bodies of the orbit, disturbances of circulation, deep-seated disease of the orbital wall, and, finally, for diagnostic purposes.

MAYEDA (367, 'The effect of corneal tattooing on sight) shows that tattooing of the cornea is quite free from danger when done under rigorous asepsis, and can then be used on perfectly sound eyes. If the natural pupil remains free, better vision is obtained than with iridectomy. Tattooing not only improves the appearance of the patient, but vision as well.

NEUSTAETTER (369, On two new methods for determining the refraction) discusses Holth's kinescopy and Lohnstein's kinematoscope.

LOHNSTEIN (371, On a modification of the reversed image and its application to determination of refraction) demonstrates that the inverted image can be very simply modified so that it appears in the same magnification as the upright image, and, again, can be used similarly for the determination of refraction with the ophthalmoscope.

WOLFRUM (373, Celloidin dry method) advises fixing specimens in Zenker's solution, hardening in alcohol of increasing strength, and embedding in water-free but thin celloidin which is gradually allowed to thicken. When the mass has the consistency of jelly, it is put in a dish with a small quantity of chloroform, which causes rapid hardening. The specimen is then ready for the microtome.

III.—MEDICAMENTS AND INSTRUMENTS

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385. ULBRICH, H. Is Mueller's interval-prothesis free from danger? *Ophthal. Klinik*, 1905, No. 15.
386. OPPENHEIM. Black bandages. *Deutsche med. Wochenschr.*, 1905, p. 468.
387. WOLFBURG. Improved protective glasses for ambulant treatment. *Wochenschr. f. Hyg. u. Ther. d. Aug.*, 1905, p. 244.
388. KAUFFMANN. Black eye-bandages. *Ibid.*, 1905, No. 42.
389. BJERKE, K. On the use of photographically diminished Reading tests for the determination of near vision. *v. Graefe's Arch.*, lx., 2. 369.
390. LUNDBERG, V. Swedish test-types. Stockholm, 1905.
391. ZION. Hebrew test-types according to Snellen's formula, $V = \frac{d}{D}$. *Wochenschr. f. Hyg. u. Ther. d. Aug.*, 1905, p. 97.
392. BOUCHARD. Test case for the determination of vision in simulants. *Soc. d'opht. de Paris*, 1905, Mars 19.
393. POLACK. Optotypes in complementary colors. *Rev. génér. d'opht.*, xxiv., 1906.
394. ERDMANN. Use of blue glasses in examinations by artificial light. Description of a simple apparatus for the testing of color-perception. *Muench. med. Wochenschr.*, 1905, p. 161.
395. HEIMANN. On some new apparatus for determining the illumination of work-rooms. *In. Diss.*, Kiel. 1905.
396. WERNICKE. Peculiar self-correction of one-sided myopic astigmatism. *Deutsche militaererztl. Zeitsch.*, 1905, No. 5.
397. ASK, FR. The astigmatoscope, a decided improvement on Placido's disc with a plate. *Tidskr. i. mil. Halsovard*, 1905, No. 30.
398. OPPENHEIMER, Recent improvements in bi-focal glasses. *Klin. Monatsb. f. Augenh.*, xlii., 2, p. 45.
399. KOERBER. A double lens. *Centralb. f. prakt. Augenh.*, xxix., p. 247.
400. BERGER, E. The use of the binocular loupe in ophthalmic surgery. *Rev. génér. d'opht.* xxiv., p. 243.
401. SCHIOETZ, J. H. A new tonometer. Tonometry. *Norsk. Mag. f. Laegevidensk.*, 1905.
402. HAUSMANN, W. Stereoscopic pictures for testing binocular vision and training in squint. Introduction by A. Bielschowsky. Leipzig, 1905.
403. BIELSCHOWSKY, A. Hausmann's stereoscopic pictures and their use. *v. Graefe's Arch.*, lxi., 3, p. 574.
404. DIXON, GEORGE S. Accessory apparatus for locating foreign bodies in the eye and orbit. *ARCH. OF OPHTH.* xxxiv., 3, p. 267.
405. RAMSEY, A. MAITLAND. An adjustable stereoscope for training the fusion sense. *Ophthalmoscope*, 1905, Jan.
406. TRUC, H. The operative mouth-mask in ophthalmology. *Rev. gén. d'opht.*, xxiv., p. 97.
407. SNELL, SIMEON. The electro-magnet in ophthalmic surgery. *Ophthalmoscope*, 1905, Feb.
408. MUELLER, L. A lid speculum. *Klin. Monatsbl. f. prakt. Augenh.*, xliii., 2, 266.

NARA (375, On scopolamin and its by-effects) reports a case of corneal injury and traumatic cataract in which, after instillation of scopolamin (0.04:10.0) cerebral symptoms developed in the form of a peculiar state of excitement, disappearing in two hours. In the case of a child of ten with eczematous pannus similar delirium and wandering, of a temporary nature, were noted. It is advisable to use scopolamin in no greater strength than 0.02:10.

WOTKRESENSKI (377, Stovain) uses stovain, an amyl-chloral hydratein $\frac{1}{2}$ to 1 % solution. After injection of 0.12, there is local anæsthesia lasting 20 minutes. The drug has no toxic effects.

BOUCHARD (379 Accidents due to adrenalin) observed, in the case of a girl of twenty after squint-operation under local anæsthesia with cocaine and adrenalin, mydriasis lasting several days with partial parenchymatous opacity of the cornea and vesicular separation of the epithelium. The treatment consisted in the instillation of eserine and dionin. After four months a corneal opacity was still present. The disturbance is ascribed by Bouchard to the adrenalin.

GEBB (380 Alypin, a new anæsthetic) considers alypin, a high amido-alcohol-benzoic-acid-ester, as a substitute for cocaine, but less toxic and more easily sterilized. The anæsthesia is at least as good as that following cocaine, coming on after one or two, and lasting ten minutes. There is no mydriasis, no increase of tension, and no disturbance of accommodation. The toxicity is slight in comparison to cocaine. The drug is used in 2 % to 5 % solution.

SICHERER (381, Alypin, a new anæsthetic) also considers alypin preferable to cocaine on account of slighter toxicity, and because it causes neither accommodation paresis, mydriasis, nor corneal lesions. JACOBSON (382, Alypin, a new succedaneum for cocaine), too, recommends this drug, using it in 2 to 2.5 % solution, particularly in glaucoma as it does not increase tension.

HIRD (383, Ethyl-chlorid in eye-surgery; with an account of a fatality) has had wide experience with ethyl-chlorid. He considers it pleasant and free from danger, and has never seen any unpleasant effects, except in the one case which he reports. The death did not take place in an eye-case. Ethyl-chlorid had been used in an operation for the removal of suppurating glands of the neck, in a case which was particularly unsuited to this anæsthetic. The patient took the anæsthetic without struggling.

After one and a half minutes he was considered to be sufficiently under its influence. An incision was made over the swelling, when the patient suddenly stopped breathing. Everything possible was done to resuscitate the patient, but without avail. The result of the coroner's inquest was that the anæsthetic was the cause of death.

DEVEREUX MARSHALL.

ULBRICH (385, Is Mueller's interval-prothesis free from danger?) reports a case in which Mueller's interval-prothesis was inserted after enucleation for sarcoma of the ciliary body. Soon after, symptoms of pyæmia developed, and the patient died. The wound cavity was covered with a slimy yellow secretion, in which streptococci in large numbers were found.

BJERKE (389, On the use of photographically diminished reading tests for the determination of near vision) recommends photographic miniatures of test-types for the determination of short-range vision, and finds them particularly serviceable in the visual test of high myopia.

POLACK's (393, Optotypes in complementary colors) optotypes of alternating red and green stripes, 6mm broad, running parallel, and in various angles. According to the author's views on chromatic aberration in the human eye (*Cf.* Review in *Arch. f. Augenh.*, lii., p. 263), only emmetropes see both colors clearly at the same time. Hypermetropes see the green stripes white, and the red ones darker than they really are. The myope sees the red stripes light red, and the green stripes dark gray. After correction of ametropia, both stripes are seen in their right colors.

BERGER.

HEIMANN (395, On some new apparatus for determining the illumination of workrooms) recommends Wingen's photometer, and prefers it to all other instruments of the sort.

WERNICKE (396, Peculiar self-correction of one-sided myopic astigmatism) tells of a patient who corrected his unilateral myopic astigmatism by means of a button which pressed upon the globe, and was kept in place by a cord passing around the head.

OPPENHEIMER (398, Recent improvements in bi-focal glasses) describes two new models of eye-glasses with a double focus, of which one is made by Borsch in Philadelphia, the other by Struebin in Basle.

KOERBER (399, A double lens) has devised a double lens. It has two lenses, of 13 D. and 20 D. convex, respectively, as required for oblique illumination and for ophthalmoscopy in the inverted image, both mounted in a single oval frame.

BERGER (400, The use of the binocular loupe in ophthalmic surgery) speaks for the use of the binocular loupe, about which the article of Morax in the Handbook of Lagrange and Valude contains misleading statements. Morax speaks of the v. Zehender instrument and that of Westien as two different loupes, whereas there is but a single instrument, the Zehender-Westien, made after the principle of a Galileo telescope or binocular Chevalier-Bruecke loupe. The Jackson loupe and that of Berger, which Morax thinks identical, are different instruments. The latter is a binocular watchmaker's loupe, allowing many workmen who were formerly monocular to use both eyes. The new binocular loupe is in use in a number of factories, in Clermont-Ferrand, and in the Northampton Institute in London. BERGER.

SCHIOETZ (401, A new tonometer. Tonometry) has constructed a tonometer by means of which variations in intraocular pressure can easily be detected and recorded in values allowing comparison. The apparatus consists of a metallic case, ending in a foot-plate 9mm in diameter and concave (curve of 15mm radius). In this, a rod, 3mm in diameter, slides. Its base, which is to rest upon the cornea, has a similar concavity. Against the more pointed upper end of the rod there rests, in sliding contact, a short curved lever-arm, the longer arm of the lever being vertical and acting as a pointer, showing the amplitude of excursion on a scale. A diagram accompanying the instrument indicates the value in mm. of Hg. of a given reading. The apparatus weighs 4gm, and is applied to the cornea after anæsthesia with 2 % holocain, the patient lying supine. To allow the instrument to be used under various conditions of tension, it is supplied with four different weights, to be attached as required. Schioetz finds that the normal tension of the eye varies from 22 to 31mm. When the pressure rises above 30mm, the eye is suspicious, and should be kept under observation. As a proof of the practical value of this tonometer, a number of cases of glaucoma are reported in which the action of pilocarpin on the tension was accurately indicated by the instrument. HELLGREN.

HAUSMANN'S (402, Stereoscopic pictures for testing binocular

vision and training in squint) stereoscopic pictures for test of binocular vision and exercise in squint have a number of improvements. The two half-pictures on each card have about the same amount of detail in contour, so that there is no tendency to suppress one half-image. The number of details in the contour is rather large. For very defective vision there are pictures with very large surfaces of black and white. This, with the simplicity of the pictures, makes fusion easy. This is also aided by the greater part of the outline falling on identical retinal points, while there is but a slight lack of correspondence between those points of the outline which are not to be seen by corresponding points in order to produce the effect of depth. In this way the rivalry of contours is reduced to a minimum. Fusion of contours which do not correspond cannot take place. With binocular fusion all the pictures give a sensation of depth. As this is one of comparative simplicity, it can be described even by children. The half-pictures themselves give no clue to an interpretation of depth (by judgment). The distance between the two halves of the pictures can be varied, a distinct advantage, as the position of the pictures can be made to correspond exactly to the squint position in each case, while a gradual change in the distance of the pictures after fusion serves to introduce the training of the fusion faculty, which is the beginning of the "orthopædic" exercises in squint. The instrument is inexpensive.

BRUECKNER.

RAMSAY'S (405, An adjustable stereoscope for training the fusion sense) apparatus is a modification of Worth's amblyoscope. It is intended to be fastened to a table, and the use of total reflection by prisms instead of mirrors prevents disturbing double images. Behind each picture there is a little electric lamp, a more practical arrangement than that of the usual sliding lamp. The apparatus is made by Trotter, of Glasgow.

DEVEREUX MARSHALL.

TRUC (406, The operative mouth-mask in ophthalmology) advises for narcosis an appliance which covers the mouth of the patient only, and leaves the field of ophthalmic operations completely free. The apparatus is fastened to the patients' ears by spectacle bows.

BERGER.

SNELL (407, The electro-magnet in ophthalmic surgery) was a pioneer in the use of the electro-magnet and its introduction into

ophthalmology. The first case in which he applied this method dates from 1880. His experience is now based on 300 cases. Snell's magnet is a hand magnet, and, without condemning the giant magnet, he brings out the advantages of the more handy instrument. It has the advantage over Haab's instrument of portability and cheapness. DEVEREUX MARSHALL.

MUELLER (408, A lid speculum) has devised a lid speculum which falls out, of its own accord, as soon as it is closed. When the lock is closed, the plates which engage under the lids are turned through an angle of 90° automatically.

Sections IV.-VII. Reviewed by DR. ABELSDORFF, Berlin.

IV.—ANATOMY.

409. MOLL, A. On the demonstration of the neuroglia and axis-cylinders in the optic nerve. *Fetsch. f. J. Hirschberg*, p. 195.
410. KRUECKMANN, E. On pigmentation and proliferation of the retinal neuroglia. *v. Graefe's Arch.*, lx., 2, p. 350.
411. PESCHEL, MAX. Structureless eye-membranes under the ultra-microscope. *Ibid.*, lx., 3, p. 557.
412. HEINE. Note on the appearance of the retinal rods in cross-section. *Ibid.*, lx., 3, p. 451.
413. MILDENBERGER, A. Does the optic nerve of the horse contain central vessels? *In. Diss.*, Tuebingen, 1905.
414. STOCKMEYER, WOLFGANG. On the central retinal vessels of some indigenous carnivora. *In. Diss.*, Tuebingen, 1905.
415. STAIGER, E. On the central retinal vessels of our indigenous ungulates. *In. Diss.*, Tuebingen, 1905.
416. RAWITZ, B. Contributions to the microscopic anatomy of the cetaceæ. IV. The anterior half of the globe of *Phocæna communis* Cuv. and the iris of *Balænoptera musculus*. *Internat. Monatsschr. f. Anat. u. Phys.*, xxii., p. 265.
417. ZIETSMANN, OTTO. The "grape seeds" (iris-nodules, *corpora nigra*) of our domestic mammals. *Arch. f. Mikr. Anat.*, 65, p. 611.
418. BRAUNE. A contribution to our knowledge of cilio-retinal vessels. *Klin. Monstbl. f. Augenh.*, xliii., 1, p. 579.
419. GROENOUW. Intrasccleral nerve-loops. *Ibid.*, xliii., 1, 637.
420. VERMES, LUDWIG. On the neuro-fibrils of the retina. *Anat. Anzeiger*, xxvi., p. 601.
421. TARTUFERI, F. On a new method of metallic impregnation of the tissues, especially the cornea. *Ann. di Ottalm.*, 1-2, 1905.

MOLL (409, On the demonstration of the neuroglia and axis-cylinders in the optic nerve) lays small pieces of the nerve in 20 % formalin for two days, then for three days in Weigert's

glia-mordant in the thermostat. The paraffin sections are stained with a concentrated watery solution of acid fuchsin for $\frac{1}{4}$ hour, then in a wine-yellow solution of hæmatoxylin, and differentiated in permanganate of potash. The connective-tissue is yellowish, the axis-cylinders violet, the neuroglia red. Sections which have not been previously treated are placed in concentrated acetate of copper for twenty-four hours. Even this method is not "mathematically" exact and sure.

KRUECKMANN'S (410, On pigmentation and proliferation of the retinal neuroglia) anatomic investigations show an intercommunication of the entire retinal neuroglia-tissue, spider cells, Mueller's supporting fibres, external and internal limiting membranes (reticular membrane, according to Krueckmann), and perivascular glia membranes, which invest the retinal vessels. All those fibres, fibrils, and protoplasmic elements which have any direct, organic connection with either of these limiting membranes must be interpreted as glia elements.

PESCHEL'S (411, Structureless eye-membranes under the ultra-microscope) investigations with the ultra-microscope include Bowman's and Descemet's membranes, the zonule, and the lens capsule. In the first two, a fibrillary structure could be made out, which was more marked in the case of Descemet's membrane. The anterior and posterior lens-capsule of adult human beings and horses appear to be perfectly homogeneous and devoid of structure, while in the newly-born a structure appears. The appearance of the zonule corresponded with its well-known fibrillary structure.

According to HEINE (412, Note on the appearance of the retinal rods in cross-section), the rods of the human macula are circular in cross-section, while in the æquatorial region they show a regular hexagonal form like that of the cones of the foveal region.

MILDENBERGER (413, Does the optic nerve of the horse contain central vessels?) discusses the question as to the presence of central vessels in the optic nerve of the horse, about which there is much controversy in the literature. Longitudinal sections show that an artery enters the nerve 8-9mm behind its termination at the globe and divides near the disk, while the vein does not penetrate the nerve stem until just back of the papilla. The cross-sections seemed at variance with this finding. Two veins

run in the axis of the nerve "in all probability," while the question of arterial supply remained undecided. This diversity in material from only two animals speaks for a marked variability in the vascular distribution. There was, however, an axial island of connective tissue to be found in both longitudinal and cross-sections, showing that central vessels are generally present.

STOCKMEYER (414, On the central retinal vessels of some indigenous carnivora) examined longitudinal and cross-sections of the optic nerve of dogs, foxes, and cats for central vessels. They enter the nerve below, 1.5-2mm behind the sclera, and on the way to the papilla send off some small branches for the supply of the nerve. In the dog and fox there are numerous anastomoses in the nerve-head between the central and the cilio-retinal vessels. The latter are the principal source of blood-supply to the retina of the cat, as the central vessels are of extremely small calibre, and are very poorly developed in comparison to the cilio-retinal vessels at the margin of the disk.

STAIGER (415, On the central retinal vessels of our indigenous ungulates) found that the retina of ungulata (ox, sheep, goat, deer, pig) is supplied mainly by central vessels; the cilio-retinal vessels are poorly developed. They possess a characteristic connective-tissue strand in which the vessels enter the nerve from below and then run forward and upward. The central vessels differ from those of human beings in being branches of the posterior ciliary vessels which do not enter the nerve until it has pierced the sclera, so there is but a short stretch from their entrance to their division on the papilla. In the pig, remains of the hyaloid artery were also to be found at the point of branching. In goats, only the vein appears as a central vessel, while the artery runs in the sclera parallel to the axis of the nerve. In deer, too, only one vessel, probably a vein, was found; the other vessels entering in the neighborhood of the lamina cribosa were of cilio-retinal origin.

RAWITZ'S (416, Contributions to the microscopic anatomy of the cetaceæ. IV. The anterior half of the globe of *Phocæna communis* Cuv. and the iris of *Balænoptera musculus*) description of the anterior segment of the globe in cetaceæ, phocæna, and balænoptera calls attention to a remarkable vascularity of the iris and the blood-plexus-like structure of the ciliary body. These structures depend on the aquatic life of these animals,

as without them the impossibility of breathing in diving below the water would soon carbonize the arterial blood. The lachrymal gland of phocæna is of alveolar structure, and has become a kind of sebaceous gland, with a solid as well as a fluid secretion.

ZIETSCHMANN'S [417, The "grape-seeds" (iris-nodules) of our domestic mammals] investigations show that the "grape-seeds" of our domestic animals, which are structures growing out of the pars iridica retinae, consist of pigmented epithelial cells surrounding cavities. The latter contain vascular connective tissue and also clear fluid. The epithelial cells, containing pigment, particularly those of the horse, show signs of degeneration with the formation of a homogeneous "certainly fluid" substance. The author believes this secretion to be a secretion of aqueous in addition to that coming from the vessels of the ciliary processes and those of the "grape-seeds."

BRAUNE (418, A contribution to our knowledge of cilio-retinal vessels) saw in a patient, aged fourteen years, with myopia of 1 D. in both eyes, a cilio-retinal vessel, which appeared as a red band coming up from the depths at the margin of the disk and emptying into the central retinal vein.

GROENOUW (419, Intra-scleral nerve-loops) found in an eye enucleated for suppurative choroiditis the condition first described by Axenfeld as intrascleral loop-formation of a posterior ciliary vein. The fact that an anterior ciliary vessel accompanied the nerve leads Groenouw to infer that the blood-vessels growing through the sclera carried the preformed nerve with it into the sclera.

VERMES (420, On the neuro-fibrils of the retina) examined the retina of mammals, particularly that of the horse, with impregnation methods, especially those of Cajal and of Bielschowsky. He describes the fibrillary structure of the bi-polar cells and ganglion cells and the composition of the nerve-fibre layer of neuro-fibrils of the ganglion cells. Although the author considers the fibrillary structure of the retina as undoubted, he calls attention to his inability to find any continuity of the fibrils from the layer of rods and cones to the nerve-fibre layer which could invalidate the theory of neurones.

TARTUFERI (421, On a new method of metallic impregnation of the tissues, especially the cornea) immerses the cornea in 1 %

bichloride solution for two hours and then rinses it off in distilled water. It is then placed in a solution of sodium hyposulphite saturated with chloride of silver, which is kept at a temperature of 20°-30° C. In 3-4 months the impregnation is complete.

CIRINCIONE.

V.—PHYSIOLOGY.

422. V. SZILY. Movement after-images and motion contrast. *Zeitsch. f. Psych. u. Phys. d. Sinnesorg.*, 38, 2 and 3, p. 81.
423. PIPER, H. Observations on a case of total color-blindness of the fovea in one eye and violet-blindness of the other. *Ibid.*, 38, p. 155.
424. LIPPS, TH. An explanation of geometric-optical delusions. *Ibid.*, 34, 4, p. 241.
425. ANGLIER, R. P., and TRENDLENBURG, W. Determination of the proportions of complementary spectral colors in white mixtures. *Ibid.*, 39, p. 1.
426. NAGEL, W., and PIPER, H. On the bleaching of the visual purple by rays of various wave lengths. *Ibid.*, 39, 1 and 2, p. 88.
427. NAGEL, W. Dichromatic fovea and trichromatic periphery. *Ibid.*, 1 and 2, p. 93.
428. FICK, A. E. On the projection of retinal images outward. *Ibid.*, 1 and 2, p. 102.
429. BRUECKNER, A., and v. BRUECKE, E. The question of the possibility of distinguishing between dextrocular and sinistrocular impressions. *Pflueger's Arch.*, 107, p. 263.
430. BASLER, A. Pupillary reaction to lights of different color. *Ibid.*, 108, p. 87.
431. MARBE, K. Production of light-stimuli of short duration by means of the projection apparatus. *Ibid.*, 107, p. 585.
432. WATT, H. J. On the luminosity of single and repeated light-stimuli. *Ibid.*, p. 591.
433. v. GRUENBERG. Color equations with the aid of the three basal sensations of the Young-Helmholtz color system. *Ann. d. Physik.*, p. 165, 1905.
434. PIPER, H. On the function of the rods and cones and the physiologic significance of the visual purple. *Med. Klinik*, No. 25, 26, 1905.
435. NIESSL and MAYENDORF. The theory of cortical vision. *Arch. f. Psychiatr.*, 39, p. 586.
436. HILBERT, R. Violet vision. *Centralbl. f. prakt. Augenh.*, xxix., 134.
437. LOMER, G. A. Study of color perception. *Zeitsch. f. Psych.*, 62, p. 63.
438. LOESER. On the relation between area and stimulus value of luminous objects in foveal vision. *Festsch. f. Hirschberg*, p. 161.
439. SCHMIDT, TH. On lens images produced by reflection from the normal nucleus. *Arch. f. Augenh.*, lii., 4, p. 397.

440. HEINE. An experiment on accommodation and tension of the eye of a child just dead. *v. Graefe's Arch.*, lx., 3, 448.

441. ROEMER, P. The pathogenesis of senile cataract from the standpoint of serum-theories. II. The nutrition of the lens according to the theory of receptors and the determination of the receptor structure of the lens protoplasm. *Ibid.*, lxii., 1 and 2, p. 230.

442. BERTIN-SANS and GAGNEIRE. On the mechanism of accommodation and a new method of measuring the curvature of the anterior surface of the lens. *Arch. d'opht.*, xxv., p. 275.

443. SULZER. On Rochon-Duvigneaud's article concerning the human macula. *Soc. d'opht. de Paris*, 14 Mars, 1905.

444. SIVEN, V. O. Studies on the rods and cones as media of color perception. *Finska Laekaresaellskop.*, 1905, p. 117.

445. JENSEN, ED. Stereoscopic color perception. *Hospitalstid.*, 1905, p. 117.

446. OVIO. Pupillary reaction. Illumination and accommodation. *Ann. di Ottalm.*, 1-2, 1905.

v. SZILY (422, Movement after-images and motion contrast) starts from the observation that motionless objects under certain conditions, after perception of actual motion, appear to move. By means of uniform movement of objects in the same direction before the resting eye, or by allowing the eye to rove over resting objects or by their being brought nearer or farther, a condition of excitation is produced which outlasts the stimulus, which gradually fades away in the form of an apparent motion in the opposite direction. This phenomenon is limited to the portion of the retina stimulated by the objective impression of motion. The apparent motion is best seen when the moved surface is well lighted but the projection surface is poorly lighted and not too rich in outlines. There is a difference in the reaction of the centre and that of the periphery in that apparent motion is most easily induced and lasts longer in resting objects seen with the periphery. If the after-image of the motion takes up a large part of the field, the apparent motion in the central part of the field is not in an opposite, but in the same direction. The intensity of the motion after-image depends less on the rapidity of motion than on the number of moved objects and the length of time of their action. When one eye only is exposed to moving objects the excluded eye also sees apparent motion although less markedly. Binocular impressions of motion in opposite directions inhibit the binocular but not the monocular perception of motion after-images, while binocular impressions of motion of

different but not opposite directions lead to after-images of a mixed nature.

The motion after-images may also produce a simultaneous motion-contrast which appears in consciousness either as an undulating cloud in case the contours are closely spaced, or as contour-contrast in a number of pseudoscopies. The author infers from a résumé of his observations that the explanation of these phenomena is not to be sought in any errors of the judgment faculty, but rather in direct optical sensations of motion (Exner), which as simple primary sensory stimuli are based on processes in the central organ.

The observations of PIPER (423, Observations in a case of total color-blindness of the fovea in one eye and violet blindness in the other), concerns a man of forty-nine years, with V. O. D. = $\frac{6}{36}$, V. O. S. = $\frac{6}{18}$. The ophthalmoscopic picture was that of pallor of the temporal half of the disks, slight peripheral retinitis in the left eye, consisting in one or two small foci of pigment and atrophic patches upward and outward. Both maculæ were normal. The clinical examination showed that central color perception was more defective than that of the peripheral region. The latter could not be carefully examined, but a study of direct vision showed the following condition: the red end of the spectrum was shortened. The sensibility for differences of luminosity was normal as was the adaptation for dark, both as to breadth of adaptation and the time needed for the maximum of sensibility. The so-called twilight-values of a spectrum of low luminosity which appeared colorless even to a normal eye, showed the typical conditions of sensibility for a visual organ adapted to darkness, with the maximum of sensibility in the green region. Quantitative examination with the color equations of a Helmholtz color-mixer showed complete color-blindness in the central region of the left retina. In the right eye there was violet blindness of the central and paracentral regions with diminished sensibility for red and green.

The left eye, then, shows complete color-blindness of two separate sets of perceptive elements, both of which possess the normal faculty of adaptation to varying illumination and the corresponding sensibility. The explanation of this complete color-blindness of the cones, in which the luminosity-values of color-sensations are preserved, is not given by either the Young-

Helmholtz theory or that of Hering. According to the former, the loss of function in all three sets of color-perceptive elements should be expressed in typical complete color-blindness with its characteristic changes in sensibility. Hering's theory of the specific luminosity of colors should lead us to expect loss of color stimuli to show itself or be accompanied by sensation of spectral lights according to their values in white,—that is, not in the distribution of luminosity of the bright colored spectrum but solely in that of the colorless spectrum of low luminosity.

ANGIER and TRENDELENBURG (425, Determination of the proportions of complementary spectral colors in white mixtures) finds that the color scale which the visual purple traverses in being bleached depends on the wave length of the bleaching light. Under the influence of rays from the violet end of the spectrum, a visual yellow appears before white. Rays of short wave length simply cause the visual purple to fade out. Koettgen and the reviewer, on the contrary, concluded from absorption tests of solutions of the visual purple that simple fading invariably takes place.

NAGEL and PIPER (426, On the bleaching of the visual purple by rays of various wave lengths) exposed the retina of owls and frogs, containing visual purple, to the bleaching action of the various colors of the spectrum, and also found that there was a simple fading without any change of hue. These experiments seem to show that Kuehne's "visual yellow" does not exist.

NAGEL (427, Dichromatic fovea and trichromatic periphery) found in examining the color sense of a locomotive driver that the Holmgren wool-tests and Stilling's test with pseudo-isochromatic tables were passed with ease, while the spectrum examination showed typical green blindness. N. concludes that if we exclude purely foveal color-perception such as is used in observation of the spectrum, this patient was not color-blind, as the extra-foveal part of the retina in all probability was endowed with trichromatic color perception.

FICK (428, On the projection of retinal images outward) made a number of experiments to determine whether the visual cells of the fovea project light impressions accurately. Test objects of various shapes were presented, to be pointed out with the hand without control of sight. Although it is impossible to determine the position of the hand accurately when

the eyes are closed, the errors in the attempts at projection, both horizontally and vertically, were greater than in ordinary touch experiments, *i. e.*, "the determination of the position of a point by fixation is still less exact than by touching with the hand." The apparent contradiction to the observations of every-day life disappears, if we realize that the projection outward of a point on the retina does not depend alone on the illuminated visual cells, but must be considered as a very complicated process, in which the entire visual field and the objects in it are made use of.

BRUECKNER and BRUECKE (429, The question of the possibility of distinguishing between dextrocular and sinistrocular impressions) agree in the main with Bourdon's observation that the sensation in the eye receiving the less decided impression is due to muscle and tendon sense. They consider it dependent on central processes, and a sort of "apparent" organic sensation. The authors disagree with Heine, who believes that there is a retinal ability to distinguish between dextrocular and sinistrocular impressions, and uphold the view of Helmholtz and Bourdon that secondary factors play an important rôle in this process.

BASLER (430, Pupillary reaction to lights of different color) has tested the influence of colored lights on the pupil, following the lead of Sachs and the reviewer. He observed the pupillary changes endoptically, but used much larger color-fields and greater intensities of illumination than his predecessors. It appears that when a change from one color to another is followed by contraction, a reversal is not necessarily accompanied by dilatation, but that contraction again takes place unless there is a marked change of intensity. Fatigue for any one color showed itself by a loss of reaction to a change in the same direction between two colors, while fixation of the first color for two minutes was sufficient to produce a contraction when the same change took place again. While Sachs and Abelsdorff find that the pupillo-motor value of a color coincides with its apparent luminosity, "several experiments proved that contraction of the pupil followed a change to an apparently darker color." To explain this phenomenon, as well as the fact that contraction of the pupil may follow a change from one color to another or back again, the author calls attention to the fact that there may be a simultaneous darkening of the central part of the field and

increased illumination of the periphery, or vice versa. As the central and peripheral elements see colors in different degrees of luminosity, it is possible that "the stimulus to contraction caused by increased illumination of the periphery may be as great as, or greater than, the dilatation stimulus due to darkening of the central field."

V. GRUENBERG (433, Color equations with the aid of the three basal sensations of the Young-Helmholtz color system) uses the observations of earlier investigators to deduce the following relation between the wave-lengths of two complementary colors. If the two rays be indicated by λ and λ' , then $(\lambda - 559)(498 - \lambda') = 424$. There are complementary colors corresponding to all wave-lengths lying between 494 and 563, and these lie outside the visible spectrum in ultra-red and ultra-violet.

PIPER (434, On the function of the rods and cones and the physiologic significance of the visual purple) gives a résumé of the facts which support the theory of "duplicity," *i. e.*, that in adaptation of the retina for darkness and weak light stimuli the function of the rods predominates, that of the cones being more marked under the opposite conditions of adaptation to bright light and more intense stimulation.

NISSL and MAYENDORF (435, The theory of cortical vision) examined the brain of a patient who, after a preceding right-sided homonymous hemianopsia, showed bilateral contraction of the visual field of only $1\frac{1}{2}^\circ$ central extent, and also disturbance in orientation. The anatomical facts of importance are as follows: The entrance of the central visual tract into the cortex takes place exclusively in compact bundles or fascicles. The entire visual area marked, even to the naked eye, by the presence of Vic d'Azyr's medullary band. The cortical visual area itself produces no sensation of light, as it, like the rest of the cortex, is merely a mechanism of association which arranges optic percepts when preformed elements of stimulation are conducted to it from the periphery. The same cell complex bounded by the association-fibres of another side would produce senseless optical impressions. The macular bundle of the optic nerve also has a separate representation in the optic radiation, and the regions of the cortex connected with it are to be considered as macular visual cortex. As the macular bundle incorporates itself with the central tracts in an outward and downward direction, as well as

upward, we must consider those areas of the cortex which are situated immediately outward and downward and upward from the area of cortical vision as cortical representations of the macula.

HILBERT's patient (436, Violet vision), while convalescing from influenza, complained that all objects appeared violet-blue. After thirty-six hours this symptom disappeared. Hilbert has found record of five similar cases in literature.

LOMER (437, A study of color perception) gives a literary review and the case history of a patient, a girl with juvenile psychosis, who complained for four weeks of seeing green. Tests of color perception showed perfectly normal conditions.

LOESER's (438, On the relation between area and stimulus value of luminous objects in foveal vision) experiments sustain the theorem of Ricco that for the visibility of foveal objects the product of area of the retinal image and the light-intensity is a constant value. The experiments were carried out in the following way. After adaptation for darkness for a quarter of an hour, a determination of the liminal perception of the eye was made, and then the stimulus area was varied by changing the size or distance of the test-object, and the light-intensity modified by means of an iris diaphragm. As is well known, this law does not apply to the periphery of the retina.

SCHMIDT (439, On lens images produced by reflection from the normal nucleus) remarks in regard to an article with the same title by Hess (these *Archives*, German Edition, vol. li.) that he has often observed two anterior and two posterior lens-images in horses.

HEINE (440, An experiment on accommodation and tension on the eye of a child just dead) made the following experiment with the eye of a boy of ten, which had just been enucleated for sarcoma of the sclero-corneal limbus. A small flap wound was made at the æquator in which a "pearl" of vitreous presented. Under stimulation by the faradic current, accommodation took place as could be distinctly seen by retinoscopy, while absolutely no change took place in the bead of vitreous, showing that accommodation can take place after intraocular tension has been eliminated, and that the contraction of the ciliary muscle does not compress the vitreous. Tension is independent of accommodation, and vice versa.

ROEMER (441, The pathogenesis of senile cataract from the standpoint of serum-theories. The nutrition of the lens according to the theory of receptors and the determination of the receptor structure of the lens protoplasm) goes beyond the mere physical view of the nutrition of the lens by diffusion, osmosis, etc., and tries to establish the laws of affinity of the lens protoplasm as well as its biologic functions. He shows that the lens has receptors capable of binding antibodies. Solution of lens albumen of the pig caused agglutination of blood corpuscles of the rabbit, only, so that the lens contains specific hæmagglutinins. Of the two toxines, tetano-lysin, and tetano-spasmin, only the first is bound by the lens. With the anti-tetano-lysin present in the lens it is possible to neutralize the toxic action of this poison on rabbit blood. Besides these receptors which bind simple toxines the lens contains factors of an antihæmolytic nature, which hold fast the serum complements. Lens protoplasm neutralizes the hæmolytic action of human serum. There is a noticeable difference between the nucleus and the cortex of the lens in regard to the antihæmolytic action, the latter being much more active.

The investigations of SULZER (443, In Rochon-Duvigneaud's article concerning the human macula) as to the minimum angle under which perception is possible, agree with the anatomic findings of Rochon-Duvigneaud who found that the cones in a central area of the macula were less thick than has generally been taught. The sharpest vision is limited to an area of only 25 minutes' useful vision, to a macular region of at most 2 degrees.

BERGER.

SIVEN (444, Studies on the rods and cones as media of color perception) concludes from an exhaustive experimental and theoretic study on the function of the rods and cones in light sensation, that the retina contains only two color-perceptive terminal apparatuses. The cones are the elements concerned in the perception of long waves of light and their complements, and represent the sensory apparatus for red-green, while the rods attend to the other pair, yellow-violet. There is no special apparatus for the perception of white-black, as required by Hering's theory, as sensations of white are transmitted by both rods and cones, while the sensation of black is merely due to the more or less complete absence of any stimulation, and is to be considered as a conscious simple negative phenomenon. HELLGREN.

JENSEN 445 (Stereoscopic color perception) has noticed that when concave glasses are decentred nasally, stereoscopic color vision results, blue appearing to be nearer than red.

HELLGREN.

OVIO (446, Pupillary reaction ; illumination and accommodation) comes to the conclusion reached some time ago by Lambert. The variations in the area of the pupil are, when compared to a central area, proportional to the distance of the source of light, and inversely proportional to the square root of the intensity. Within certain limits the reaction of the pupil depends exclusively on the intensity of the light-stimulus striking the retina, whether this amount of light be distributed over a large area or limited to a very small one. The same amount of light produces a greater pupillary reaction when it strikes the centre of the retina. When the light stimulus and that of accommodation act simultaneously, the latter predominates. The pupil reacts to accommodation, without convergence, and vice versa, but the reaction to isolated convergence is the stronger.

CIRINCIONE.

VI.—REFRACTION AND ACCOMMODATION.

447. ELSCHNIG, A. The elastic fibres in the sclera of myopic eyes. *Wien. klin. Rundsch.*, 1905, No 29, p. 508.

448. HOSCH, G. On the latest theory (Prof. Lange's) of progressive myopia. *v. Graefe's Arch.*, lxi., 1, 227.

449. BIRCH-HIRSCHFELD, A. On the question of elastic fibres in the sclera of myopic eyes. *Ibid.*, lx., 3, 552.

450. SEGGER. On the nature of progressive myopia. *Muench. med. Wochensch.*, 1905, xvii., 847,

451. PFALZ. The importance of optical emmetropization in the treatment of myopia. *Ibid.*, p. 843.

452. KOENIGSCHOEFER. On myopia. *Wuerttemb. med.-corresp. Bl.*, 1905, 464.

453. HELBRON. Pathogenesis and treatment of myopia. *Berl. klin. Wochensch.*, 1905, No. 26, p. 1032.

454. V. HIPPEL. Operation for myopia and retinal detachment. *Deutsche med. Wochensch.*, 1905, No. xxvi., p. 1032.

455. WEIGELIN, S. The influence of full correction on the progress of myopia. *In. Diss.*, Tuebingen, 1905.

456. WERNICKE. Remarkable self-correction of unilateral astigmatism. *Deutsche militaer-aerztl. Zeitz.*, 1905, No. 5.

457. SCHLEY. On the frequency of, and visual acuteness in, astigmatism. *Ibid.*, xxxiv., p. 353.

458. STIRLING. Recurrent paralysis of ocular muscles associated

with pain. ARCH. OF OPHTH. xxxiv., 4, p. 341. (Case of relapsing oculomotor palsy.)

459. KATZ, R. **On vision in diffusion circles.** *Westn. Ophth.*, 1905, No. 3.

460. KOSLOSKY. **Primary extraction of the lens for high myopia.** *Ibid.*, 1905, No. 3.

461. LAGRANGE, F. **Variation of astigmatism with age.** *Arch. d'ophth.*, xxv, p. 216.

462. CHIARI, C. **Studies on the modification of the curvature of the cornea by contraction of extraocular muscles.** *Ann. di. Ottalm.*, 3-4, 1905.

ELSCHNIG (447, The elastic fibres in the sclera of myopic eyes) has tested Lange's statement that the elastic fibres are very poorly developed in the sclera of myopic eyes. An examination of a large number of globes convinces him that the elastic fibres are not disproportionately scanty, considering the marked thinning of the sclera, and that their thickness varies only within normal limits. Lange's error was due to the fact that elastic fibres behave very capriciously toward staining methods of the sclera, and also to the entirely different structure of the sclera in myopic eyes, where the usual matting is replaced by an arrangement in lamellæ. The meridional fibre-bundles run in an extended course parallel to the surface of the sclera, and exchange but few fibres. The bundles crossing these, which in meridional sections are cut across, are thin and flat. Thus, cross-sections of the fibres show the elastic fibres as dots, while those on the surface bundles of the lengthwise bundles appear in longitudinal sections in only a very small number, are not easily recognized, and so give the impression that the sclera is "very poor in elastic tissue." These anatomic findings are opposed to Lange's theory that myopia depends on congenital lack of development of the elastic fibres of the sclera.

HOSCH [448, On the latest theory (Prof. Lange's) of progressive myopia] examined one globe with low and six with high degree of progressive myopia, and found no lack or diminution in size of the elastic fibres in the sclera, so that he cannot support Lange's views.

BIRCH-HIRSCHFELD (449, On the question of elastic fibres in the sclera of myopic eyes), too, was unable to corroborate Lange's statement that there is a lack of elastic fibres in the sclera of myopic eyes. Examination of six myopic eyes showed that there

were plenty of elastic fibres in all layers of the sclera in the anterior section, as well as in the region of the ectatic posterior pole.

SEGGE (450, On the nature of progressive myopia) thinks that, besides Lange's lack of elastic fibres, the thinning of the sclera is a predisposing factor in the causation of myopia. Furthermore, if there is a poor development of the circular portion of the ciliary muscle, accommodation is accompanied by excessive action of the meridional fibres, causing tension of, and traction on, the choroid and the layers of the retina which are connected with it. Under these circumstances accommodation, too, may have a bad effect. Progressive, deletory myopia may be due to lack of elastic fibres and thinning of the sclera alone, or there may be in addition a lack of development of the ring-muscle of accommodation. In weak accommodation, full correction is to be avoided, in order not to induce spasm and consequent traction on the choroid. In low degrees of myopia and even in emmetropia, where there is weak accommodation, even a weak convex glass may be given for near work, to prevent the myopia from progressing, and so avoiding deterioration of vision.

PFALZ (451, The importance of optical emmetropization in the treatment of myopia) again calls attention to the advantage of full correction of myopia when there is good accommodation. The prismatic and astigmatic effect of strong concave lenses may be avoided by periscopic glasses or goggles. In juvenile myopes, full correction completes the hygienic management of near sight.

HELBROH (453, Pathogenesis and treatment of myopia) reviews the theories of the development of myopia and the results of full correction published above. At the Berlin University eye-clinic it has been the custom for years to prescribe full correction for distance and to "consider the astigmatism." For near vision, full correction is given to youthful myopes up to 8 D. In high, degrees and older patients under-correction is given. The statistics of these cases are not presented, but are said to be "very satisfactory, all in all."

V. HIPPEL (454, Operation for myopia and retinal detachment) has performed the operation for myopia on 275 eyes since 1893. Detachment was found in 9.5 %. As the author considers detachment coming on more than two years after operation as

independent of the surgical procedure and spontaneous in character, only 13 cases—*i. e.*, about 5 %—remain which could have been due to the operation. In cases with myopia of 14 D. or more, in which no operation was performed, and among 100,000 patients, 842 eyes of this sort were found, detachment was noted 53 times, *i. e.*, about 6.3 %. Of the operated cases, out of 149, there was detachment in the non-operated eye in 7 (4.7 %); in the operated eye in 9 cases (6 %). There is no reason for holding the operation responsible for the 9.5 % of detachment, nor for a general desertion of the extraction of the lens in high myopia.

WEIGELIN (455, The influence of full correction on the progress of myopia) had 714 cases of myopia from the Tuebingen eye-clinic under observation for at least two years. 12.6 % had full correction; 5 % full correction for distance and partial correction for near work. Most of the cases with full correction remained stationary (89.7 %), while there was progress in 56.59 % of the under-corrected cases. Even considering that with advancing age the tendency for myopia to progress becomes less (from about the twentieth year on), still there is a preponderance of progressive cases up to the twentieth year only if the cases of full correction are not counted. In case the latter are also included in the reckoning, there is a preponderance of stationary cases as early as the sixteenth year. The author notes that a decision on the subject of the value of full correction can only be reached after a study of much more extensive material, but that his cases show that full correction does no harm, and, on the contrary, in appropriate cases will prevent the progress of the disease.

WERNICKE (456, Remarkable self-correction of unilateral astigmatism) observed the following case. The patient had compound myopic astigmatism, which he partially corrected by means of a knot in a cord which was passed around the head and pressed on the upper lid. By partially closing the lids a stenopæic slit was produced which completed the correction.

SCHLEY (457, On the frequency of, and visual acuteness in, astigmatism) calls attention to the great importance of astigmatism in military life. Of 30,098 eyes examined, 2210, or 7 %, had astigmatism of 1 D. or more. There were 54 more cases among females. In 221 the astigmatism was monocular. Vision of more than $\frac{3}{8}$ was found in 12 % before, and in 67 % after, correction, so that the majority are capable of serving with the

active army, 30 % with V. $\frac{20}{40}$ - $\frac{30}{40}$ are fit for the reserve, and but 2.6 % unsuitable. Without correction the greater percentage of astigmatics would be unfit for military service. Of 2210 astigmatic eyes, 691 had oblique axes, of which 6.2 % were symmetrical. Astigmatism of 5 D. to 7 D. was found 12 times. Simple myopic astigmatism is most easily corrected; compound myopic astigmatism gives the least satisfactory results.

KATZ (459, On vision in diffusion circles) reports some cases in which myopia of high degree, as determined retinoscopically and with the refraction ophthalmoscope, presented about the same acuteness of vision before and after correction. No cause could be ascertained for the amblyopia present in these cases. Some patients may have a special faculty of seeing in diffusion circles and of interpreting the dispersion optically. This may also explain a possible accommodation in aphakia, and should not be mistaken for simulation.

HIRSCHMANN.

KOSLOWSKY (460, Primary extraction of the lens for high myopia) considers extraction of the lens justifiable in all cases of high myopia in which correction with glasses is not satisfactory (? REV.). The lens is removed without previous needling and without iridectomy. The section is made in the margin of the clear cornea. Within five years the author has operated on twenty-one eyes, without loss of vitreous. In one case lens masses remained behind and produced synechiæ. Detachment occurred in one case, two years after the operation. The average duration of treatment was eighteen days.

HIRSCHMANN.

LAGRANGE (461, Variation of astigmatism with age) studied the variations in astigmatism during growth. In forty-four cases of hyperopic astigmatism there was a decrease in forty-one. Of twenty-nine cases of myopic astigmatism there was an increase in eighteen. It is not easy to explain these facts, although the latter might be elucidated by Martin's theory of partial contraction of the ciliary muscle, which is supposed to alter the curvature of the cornea.

BERGER.

According to CHIARI (462, Studies on the modification of the curvature of the cornea by contraction of extraocular muscles), the astigmatic cornea changes its static properties when the globe is forcibly rotated inward or outward. These variations are due to the action of the lateral recti. An increase of curvature takes place in the horizontal meridian and a flattening in the vertical

meridian. These two factors produce a tendency for the astigmatism to lessen.

CIRINCIONE.

VII.—MOTOR APPARATUS.

463. FLEISCHER, B. Bell's phenomenon. *Arch. f. Augenh.*, lii., 4, 359.
464. ABELSDORFF, G. The condition of the pupils after intracranial section of the optic nerve. *Ibid.*, lii., 3, p. 309.
465. V. PFLUGK. Transplantation of the insertion ridge of the ocular muscles as a squint operation.
466. EHMER, M. Report on strabismus cases in the Giessen clinic. *In. Diss.*, Giessen, 1905.
467. WOLFF, H. On the tendon of the levator. II. Symblepharon operation. III. Transfer of the action of the superior rectus to the upper lid in ptosis. *Zeitsch. f. Augenh.*, xliii., 5, p. 410.
468. OHM. On advancement in paralytic squint. *Klin. Monatsbl. f. Augenh.*, xliiii., 1, p. 666.
469. AXENFELD, TH. Congenital disturbances of motility of the eye. *Centralbl. f. Nervenh. u. Psych.*, xviii., p. 547.
470. VORKASTENER. Three cases of rare ocular paralyses. *Ibid.*, xxviii.
471. BLASCHEK, A. An attempt to explain paradoxical associated motions of lids and eye. *Zeitsch. f. Augenh.*, xliii., 750
472. KINIKI NAKA. The peripheral and central paralyses of ocular muscles. *Arch. f. Psych.*, xxxix., 3.
473. HEDDAEUS. On the causation of myosis in reflex iridoplegia paralysis. *Centralbl. f. Nervenh. u. Psych.*, xxviii., p. 129.
474. VERAGUTH, O. On the testing of pupillary light-reaction.
475. COBURN, E. The ophthalmo-kinetograph. An apparatus to record ocular movements. *ARCH. OF OPHTH.*, xxxiv., 1, 1.
476. COLLINS, W. Traumatic palsy of levator, superior rectus, and sphincter pupillæ. Monocular amblyopia. Recovery. *Ophthalmoscope*, March, 1905.
477. DEJERINE and ROUSSY. Conjugate deviation in a case of congenital blindness. *Soc. de Neurol.*, 12 January, 1905.
478. ABADIE, CH. and CUNEO. Treatment of severe blepharospasm by spino-facial anastomosis. *Arch. d'opht.*, xxv., 201.
479. TUENZING. The influence of the cervical sympathetic on accommodation. *In. Diss.*, May, 1905.
480. MAGNANI, C. On the treatment of ocular hypotony. *Ann. di Ottalm.*, 1-2, 1905.

FLEISCHER'S (463, Bell's phenomenon) patient had lost the right eye in an explosion. The left eye was intact, but the upper lid margin was defective. After a plastic operation the lids could be almost completely closed, the globe turning upward in the at-

tempt. In the course of two months the inner part of the upper lid showed scar-thickening. At the outer part there were scarred masses of granulating conjunctiva. The globe now turned downward with gentle closure of the lids, and upward when much exertion was used. Two years later all attempts at closure were accompanied by rotation of the eyeball inward and downward. This observation seems to speak in favor of a subcortical centre of co-ordination of the orbicularis with the oculomotor muscles, and against an anatomic connection between the latter and the facial. It also supports Nagel's view that in Bell's phenomenon the associated motion is a reflex. In rotating upward the eye would have been put in a very unpleasant position. The position assumed was that in which there was least pressure on the cornea.

ABELSDORFF (464, The condition of the pupils after intracranial section of the optic nerve) was unable to corroborate the observation of Marengi that there is persistence of the light-reaction of the pupil after intracranial section of the optic nerve. Even when the orbit was not touched, interruption of the conduction through the optic nerve was invariably followed by loss of reaction to light.

EHMER (466, Report on strabismus cases in Giessen clinic) found in 633 cases of convergent squint, 39 cases in which there was a similar affection in other members of the family. The refraction was hyperopic in 64 %, myopic in 3.6 %, and emmetropic in 1.5 %. Ehmer has found 32 cases (? REV.) in which the vision improved after operation. Convergent squint was found in 1.49 % (of 52,000 cases), divergent squint in 0.76 %, and strabismus sursumvergens or deorsumvergens in 0.0076 %. Associated with the squint or following it, the author noted asymmetry of facial development, curvature of the cervical spine, and abnormal carriage of the head and shoulder in 46 cases.

WOLFF (467, On the tendon of the levator. II. Symblepharon operation. III. Transfer of the action of the superior rectus to the upper lid in ptosis) again shows by drawings that there is a tendon of the levator palpebræ superioris which runs down in front of, and is fastened to, the anterior surface of the tarsus. He also reports a complete success, in the case of a girl of sixteen, of the operation mentioned, consisting in the transplantation of flaps

to the tendon radiation of the superior rectus, and shows that this structure is especially suited for the attachment of the tarsus in cases of ptosis.

OHM (468, On advancement in paralytic squint) advises advancement as the only operation indicated in paralytic squint. Five case-histories are given to show the result. The second of these shows that a paralysis of the external rectus of obscure ætiology was operated within one month of its development.

AXENFELD (469, Congenital disturbances of motility of the eye) notes that the structure of the paralyzed muscle, or of the tissue which supplants it, is a determining factor in the development or non-development of paralytic squint in congenital abducens paralysis. The atrophy and connective-tissue degeneration of the muscle, which are almost invariable in acquired palsy, are not at all necessary accompaniments of the congenital form.

BLASCHEK (470, Three cases of rare ocular paralyses) saw two cases of ptosis, due to syphilitic oculomotor palsy, in which there was a dilatation of the lid-fissure on abduction, and narrowing on adduction, of the paralyzed eye. On looking upward there was slight enlargement of the lid-fissure. This was more marked when the gaze lowered. This phenomenon is merely an accentuation of the normal conditions in which adduction is accompanied by a slight raising of the lid, and abduction by a slight lowering, although the opposite is sometimes observed. The widening of the lid-fissure on downward rotation of the ptotic eye is explained by spasm of the levator associated with a slight lowering of the lower lid.

KINKI NAKA (472, The peripheral and central paralyses of ocular muscles) observed the following cases in the Kiel clinic :

1. Left peripheral oculomotor palsy accompanying tuberculous meningitis in an alcoholic subject, aged twenty-nine. Autopsy showed hemorrhages and cheesy degeneration of the meninges, tubercle formation on the ependyma, and marked involvement of all the ocular nerves at their points of exit. Slight hemorrhage in the oculomotor nucleus without cell-changes, spotty degeneration of the oculomotor and acousticus roots.

2. Chronic ophthalmoplegia externa and interna of nuclear origin in a case of tabic paralysis with optic atrophy. The autopsy showed degeneration of the abducens nucleus and the

intramedullary root, normal ventral abducens nucleus, total degeneration of the trochlearis nuclei, principally in the proximal region, marked changes in the lateral nuclei of the oculomotorius and the root-fibres, slight changes in the central nucleus. There was marked atrophy of all the nerves of the ocular muscles and degeneration of the muscles themselves.

HEDDAEUS (473, On the causation of myosis in reflex pupillary paralysis) finds that in reflex iridoplegia in which there is usually no oscillation of the pupil, accommodation for near vision causes a contraction stimulus and the pupil gradually contracts. There is no explanation of the persistence of this accommodative contraction.

VERAGUTH (474, on the testing of pupillary light-reaction) describes an incandescent lamp, run by a dry cell and attached to a convex lens and an iris diaphragm. By pressure on a button, momentary illumination is produced and the light-reflex of the pupil can be studied.

COBURN'S (475, The ophthalmo-kinetograph, an apparatus to record ocular movements) apparatus is a photographic camera with two lenses, which receive the images of the corneal reflex of both eyes, one on a horizontally-moving plate, the other on a vertically-moving plate. In this way the movements of both eyes may be recorded graphically.

COLLINS'S (476, Traumatic palsy of levator, superior rectus, and sphincter pupillæ; monocular amblyopia; recovery) patient was a boy of fourteen with ptosis of the right upper lid and marked mydriasis. Five days before, he had been struck in the right eye with a pitchfork. No penetrating wound could be found, although there was a small laceration of the conjunctiva at the inner canthus. Besides complete ptosis, there was loss of motility upwards. The pupil was widely dilated, and did not react. Vision was reduced to perception of light. There was no disturbance of sensibility, and the fundus was normal. After several weeks the symptoms disappeared completely. Collins is of the opinion that the injury produced "molecular" changes in the optic nerve, the ciliary nerves or muscles, and in the extra-ocular nerves or the muscles themselves, causing a temporary loss of function.

DEVEREUX MARSHALL.

DEJERINE and ROUSSY (477, Conjugate deviation in a case of congenital blindness) observed left hemiplegia with associated

conjugate deviation of the eyes toward the left and of the head to the right, in a woman of sixty-one, born blind, coming on after an apoplectic seizure. Autopsy showed a focus of softening in the retro-lenticular area of the internal capsule, with involvement of the nucleus lentiformis, optic thalamus, and Gratiolet's optic radiation. This demonstrates that conjugate deviation may occur without hemianopsia, that the condition is probably of uniformly paralytic character (as the patient could correct the faulty position at will), and that there can be no single cortical centre for rotation of the eyes and head, as both motions may take place independently, *i. e.*, rotation of the eyes to one side and of the head to the other.

BERGER.

ABADIE and CUNEO (478, Treatment of severe blepharospasm by spino-facial anastomosis) report a case of severe blepharospasm in which an excellent result was obtained by artificial anastomosis of the spinal accessory with the peripheral stump of the facial after the method of Kennedy. Of twenty-four cases operated so far, there were only six failures. Regeneration of the peripheral part of the facial took place in from seven days to two months. The technique of the operation is described in detail.

TUEMZING (479, The influence of the cervical sympathetic on accommodation) reviews the literature on the influence of the cervical sympathetic on accommodation, and reports the results of his own experiments, on cats and dogs. Preliminary iridectomy was made in two meridians whose refraction was then determined by retinoscopy under eserine. Tests were then made during narcosis by local electrical stimulation of the globe which produced contractions of the ciliary muscle, as well as during irritation of the sympathetic and simultaneous irritation of the globe and of the sympathetic. Tuemzing comes to the following conclusions:

1. The sympathetic has no influence on accommodation. Section of the nerve does not produce spasm, and irritation is not followed by either positive or negative accommodation. Irritation of the sympathetic has no inhibitory effect on an already induced dynamic refraction increase.

2. Stimulation of a long ciliary nerve causes no diminution in dynamic refraction.

JITTA.

MAGNANI (480, On the treatment of ocular hypotony) attributes lowered tension following injury or intraocular inflammation to

paralysis of the sympathetic. He has successfully treated five cases of this sort with galvanism of the cervical sympathetic of the affected side, using a current of 10-20 amperes for ten minutes. The positive pole is placed at the back of the neck, the negative pole on the anterior margin of the sterno-cleido-mastoid muscle.

CIRINCIONE.

Sections VIII-XII. Reviewed by DR. R. SCHWEIGGER,
Berlin.

VIII. LIDS.

481. MOREAU, E. Malignant œdema of the lower lid, without pustule. Anthrax bacillus present. Recovery. *Rev. gén. d'opht.*, xxiv., p. 193.
482. MANZUTTO, G. Case of double initial sclerosis of the lids. *Ann. di Ottalm.*, 1-2, 1905.
483. MORAX and DRUAIS. Ulcerative syphilitic tarsitis. *Soc. d'opht. de Paris*, 14 Mars, 1905.
484. SCHAPRINGER. On varieties of epitarsus. *Centralb. f. prakt. Augenh.*, xxix., p. 129.
485. HOCHHEIM, W. The operative technique in cicatricial ectropium complicated with trichiasis. *Arch. f. Augenh.*, lii., 1-2, p. 201.
486. BRIGANTI. The transplantation method for the treatment of trichiasis and new instruments for the operation. *ARCH. OF OPHTH.*, xxxiv., 3, p. 246.
487. BIRCH-HIRSCHFELD, A. On Buedinger's tarsoplasty. *Klin. Monatsbl. f. Augenh.*, xliii., p. 1, 463.
488. ELTER and HAASS. New method of operation for lid-defects and ectropium, by grafts from the auricle. *Muench. med. Wochenschr.*, 1905, No. 38, p. 1821.
489. MORETTI, E. Paraffin injections in the treatment of entropium. *Ann. di Ottalm.*, 5-6, 1905.
490. AGABABOW, A. Modifications of the entropium-operation. *Westn. Ophth.*, 1905, No. 3.
491. SCHIMANOSKY, A. On the operation for ptosis. *Westn. ophth.*, 1905.
492. TAYLOR, J. Case of congenital ptosis and meningocele. *Report of the Soc. Dis. of Childr.*, vol. 4.
493. SCIMEMI, E. Plexiform neuroma of the lids. *Ann. di Ottalm.*, 5-6, 1905.
494. VALUDE, Melanosis of the lids in progressive spots. *Soc. d'opht. de Paris*, 14 Mars, 1905.
495. UHTHOFF. Paraffin tumor of the lids after plastic injection into the bridge of the nose. *Berl. klin. Wochenschr.*, 1905, xxxv., p. 1127.

SCHAPRINGER (484, On varieties of epitarsus) reports three cases of pronounced epitarsus of a triangular pterygium-like

form. Both crura were free of the neighboring tarsal mucous membrane.

HOCHHEIM (485, The operative technique in cicatricial entropium complicated with trichiasis), modifies the usual wedge-form Snellen incision for entropium with trichiasis by a special arrangement of the sutures. In place of the characteristic intermarginal section in front of the openings of the Meibomian glands, the intermarginal part of the tarsus is split throughout its entire length without regard to the glands to a depth of *2mm*. Any glands which have not degenerated are curetted. A skin-graft from the upper lid is then transplanted into the tarsal cut.

BIRCH-HIRSCHFELD (487, On Buedinger's tarsoplasty) has performed, in five cases, Buedinger's operation, replacing the lid and tarsus by a skin and cartilage flap from the concha. The procedure is recommended in cases of amputation of the lid as well as in severe trachoma. In order to avoid irritation of the cornea by the cartilage of the flap, the skin flap which is to form the conjunctival surface is made somewhat larger and carefully sutured.

ELTER and HAASS (488, New method of operation for lid-defects and entropium by grafts from the auricle) also use as a substitute for the lower lid a flap of skin and cartilage from the auricle, partly from the attached and partly from the free border.

MORETTI (489, Paraffin injections in the treatment of entropium) injected paraffin melting at 70° C. into the upper lid of a rabbit. The lid was held in a Desmarres lid clamp and the injection made along the lid margin between the cutis and the tarsus. Swelling and redness developed, which disappeared in 25-30 days. The ciliary margin remained ectropionated, so that a small rim of ocular conjunctiva could be seen at the lid margin.

CIRINCIONE.

AGABABOW (490, Modifications of the entropium-operation) has made use of the following operation, during the last few years: After fixing the lid, in Knapp's or Desmarres's clamp, the section is made, as in Snellen's method, through skin and muscle, down to the tarsus and parallel to the lid margin. The soft parts are dissected back off the tarsus above, to the ligamentum tarsi, and below, almost to the roots of the cilia. Instead of exsecting a wedge-shaped piece from the tarsus, a furrow is burnt into it with the thermo-cautery, about *1mm* wide, and *0.5-0.75mm* deep. The burnt tissue is easily rubbed away with a moistened swab.

The margins of the furrow are approximated by traction on the lower edge of the skin incision with a forceps, and the latter closed by five sutures. Each suture is passed through the upper skin wound, through a fold of the ligamentum tarsi, and finally through the lower skin-wound, emerging at the lower lid margin. This procedure has been used in nearly 1000 cases since 1900. The results were satisfactory. The operation can be regulated to the degree of the entropium. HIRSCHMANN.

TAYLOR'S (492, Case of congenital ptosis and meningocele) patient was a boy of five and one-half, whose eyes had been prominent since infancy. The skull was peaked. There was an occipital meningocele, exophthalmus, squint, nystagmus, and lack of mental development. Vision had recently become markedly worse through optic atrophy.

UHTHOFF'S (495, Paraffin tumor of the lids after plastic injection into the bridge of the nose) patient had had an injection of paraffin for saddle-nose. The mass had extended so far into the lids that they could not be opened spontaneously. Uththoff succeeded in extirpating enough of the paraffin to mobilize the lids. The paraffin lay subcutaneously but extended deep into the orbit.

IX.—LACHRYMAL APPARATUS.

496. WICKERKIEWICZ. On acute inflammations of the lachrymal gland. *Arch. d'opht.*, xxv., p. 347.

497. ORLANDINI, O. Studies on dacryo-adenitis. *Ann. di Ottalm.*, 7, 1905.

498. MORETTI, E. Case of suppurative orbital dacryo-adenitis after facial erysipelas. *Ann. di Ottalm.*, 1, 1905.

499. PARIRETTI, O. Tuberculosis of the lachrymal gland. *Riv. Ital. di Ottalm.*, 2, 1905.

500. BASSO, D. Chronic affections of the lachrymal passages studied by means of extirpation of the lachrymal sac and duct. *Ann. di Ottalm.*, 3-4, 1905.

501. LEBLOND. On dacryocystitis following radical operation (Luc-Caldwell) on the maxillary antrum. *Arch. d'opht.*, xxv., p. 295.

502. RICHTER. Furuncle of the lachrymal caruncle. *Beitr. z. Augenh.*, 63, p. 11.

ORLANDINI (497, Studies on dacryo-adenitis) reports fourteen cases of dacryo-adenitis, observed at Venice within a few years, and adds a histologic and bacteriologic report. The palpebral gland is especially susceptible to disease by propagation of

inflammatory processes along the vessels or efferent ducts. The only micro-organism found was the staphylococcus.

CIRINCIONE.

MORETTI (498, Case of suppurative orbital dacryo-adenitis after facial erysipelas) observed a case of suppurative dacryo-adenitis due to facial erysipelas, and concludes that the streptococcus reached the tissue of the gland by way of the lymphatics instead of through the excretory ducts, and that the germ originally penetrated into the lymphatics of the orbital cellular tissue, causing prominence of the globe and complete loss of motility. According to the case-history, the affection of the gland was secondary to the orbital involvement.

CIRINCIONE.

BASSO (500, Chronic affections of the lachrymal passages studied by means of extirpation of the lachrymal sac and duct) found 22 per cent. of simple stenosis without actual occlusion of the lumen in 22 per cent. of forty-one lachrymal sacs and ducts which he had extirpated; obliteration of the lachrymal canal at the upper end with permeability below the obliterated point in 8 per cent.; obliteration of the lower segment of the canal in 40 per cent.; finally, total obliteration of the canal with change into a fibrous cord. In one case of simple epiphora, histologic examination showed advanced infiltration and œdema of the canal-walls in consequence of congestion. Simple dacryo-cystitis is accompanied by infiltration and hyperplasia of the mucous membrane, with proliferation of vessels and detachment of the epithelium, the changes being more marked at the upper end of the canal. In dacryo-cystitis with reducible tumor of the sac, the most common change is an isolated cicatricial obliteration of the lower end of the canal, and in most of the cases examined there were conditions present which favored obliteration in this segment. In mucocele there is a slow process of chronic inflammation with hyperplasia of the mucous membrane and epithelium of the sac. The contents have the characteristic properties of the normal secretion. In empyema, on the other hand, there is a predominance of inflammation with granulations, loss of epithelium, and pus production.

CIRINCIONE.

RICHTER (502, Furuncle of the lachrymal caruncle) reports a case of furuncle of the lachrymal caruncle which developed

after injury. In the pus, streptococci and staphylococci were found, with rods closely resembling xerosis bacilli. The case was undoubtedly one of infection with pyogenic micro-organisms.

X.—ORBIT AND ACCESSORY CAVITIES.

503. SOEDERLINDH. Grippe tenonitis followed by optic atrophy. *Soc. d'opht. de Paris*, 4 April, 1905.

504. AXENFELD, Th. Kroenlein's osteo-plastic resection of the orbit for the treatment of retrobulbar tumors. *Muench. med. Wochensch.*, 1905, No. 23.

505. PIEHL. A slight modification of the skin incision in Kroenlein's operation. *Centralbl. f. prakt. Augenh.*, xxix., p. 161.

506. BARDELLI, L. On the diagnosis of echinococcus of the orbit. *Ann. di Ottalm.*, 5-6, 1905.

507. MAERZ, M. Report on four cases of exophthalmus. *In. Diss.*, Giessen, 1905.

508. CRAWFORD, L. Case of exophthalmus in the newly-born. *Lancet*, Nov. 19, 1904.

509. BORLAND, H. Case of exophthalmus in the newly-born. *Lancet*, Nov. 12, 1905.

510. SPIELER. Association of adenoids with exophthalmus. *Deutsche med. Wochensch.*, 1905, No. 35, 1415.

511. KALT. Traumatic dislocation of the globe into the maxillary and nasal cavities. *Soc. d'opht. de Paris*, 14 Mars, 1905.

512. ROHMER. Double encephalocele of facial type at the inner angle of the orbit. *Arch. d'opht.*, xxv., pp. 329, 512.

513. ALEXANDER, F. Two rare cases of eye complications in empyema of the accessory sinuses. *Muench. med. Wochensch.*, 1905, 29, 1415.

514. BOSSALINO, D. Hemorrhagic cysts of the frontal sinus. *Ann. di Ottalm.*, 5-6, 1905.

AXENFELD (504, Kroenlein's osteo-plastic resection of the orbit for the treatment of retrobulbar tumors) admits that tumors visible alongside of the globe can often be removed from in front, without sacrificing the eye, if they are not diffuse and can be operated radically. If they extend into the depths, Kroenlein's operation is the method of election in these cases as well as for all retrobulbar growths, the character of which cannot usually be determined with accuracy. In retrobulbar inflammations, too, whether metastatic or by continuity, the temporary resection of the outer orbital wall is of great advantage. If pus is not found at once it is not advisable to search around in the orbital tissues, but the peri-orbita should be carefully loosened. In this way affections of the accessory cavities

are often discovered and cured. Axenfeld also recommends the use of hand-lamps, and of peculiar retractors, shaped like flat spoons, to hold back the orbital fat and shield the globe.

PIEHL (505, A slight modification of the skin incision in Kroenlein's operation) recommends a new skin incision for the Kroenlein operation. It consists of two connected halves. The orbital incision begins at the outer third of the brow, and runs with a curve with the concavity inward and downward, to the outer bony margin of the orbit at the level of the zygoma. The temporal incision begins at the end of the first cut, and runs almost at right angles along the upper edge of the zygoma.

BARDELLI (506, On the diagnosis of echinococcus of the orbit) observed a case of echinococcus cyst of the orbit, which showed, in addition to the usual symptoms of an orbital tumor, papillitis and orbital pain. Attention is called to the importance of a blood examination, which in this case showed a marked increase in polynuclear eosinophiles, and aroused suspicion of the presence of an echinococcus.

CIRINCIONE.

MAERZ (507, Report on four cases of exophthalmus) describes a case of exophthalmus, probably due to varicose veins of the orbit, which was unilateral and intermittent, and was increased by stooping. Vascular murmurs were not detected. The pupil of the affected eye was at times contracted, and, again, normal. A central scotoma was probably due to the abuse of alcohol by the patient. The second case was that of a woman of fifty-one, who had had cough and snuffles for a long time, and developed unilateral exophthalmus, which subsided under a moist compress after large masses of muco-pus had been expelled, probably from the accessory cavities. During the clinical examination, markedly dilated venous plexuses appeared at the inner canthus, in the lower fornix, and above and below the cornea, and later disappeared spontaneously. The third patient, aged twenty-nine, had suffered with left-sided, pre-menstrual headache, and suddenly developed left exophthalmus with slight ptosis, without evident cause. Under a moist compress the symptoms disappeared, and the next menstruation was not attended by headaches. The fourth case, that of a woman of forty-eight, did not run as favorable a course as the first three. An exploratory operation (Kroenlein) revealed no cause for the gradual blindness and

accompanying exophthalmus. Soon after the other eye was affected in a similar manner, and the case was diagnosed as one of probable brain tumor.

CRAWFORD (508, Case of exophthalmus in the newly-born) saw a marked exophthalmus in a child soon after a normal delivery. This disappeared without any apparent injury to vision.

DEVEREUX MARSHALL.

BORLAND'S (509, Case of exophthalmus in the newly-born) patient was a newly-born child of a healthy mother. The delivery was normal; forceps were not used. Several hours after delivery a subconjunctival effusion of blood was noted in the right eye. Next day there was a protrusion of the globe outward, forward, and downward, with paralysis of the superior rectus. The symptoms eventually disappeared, and the child made a complete recovery.

DEVEREUX MARSHALL.

(These two cases suggest orbital hemorrhage due to infantile scurvy, or Barlow's disease.—P. H. F.)

SPIELER (510, Association of adenoids with exophthalmus) believes that exophthalmus may be caused by retrobulbar stasis in the lymphatics due to adenoid growths.

ALEXANDER (513, Two rare cases of eye complications in empyema of the accessory sinuses) saw intraocular changes, consisting in papillitis and abscess of the vitreous, which developed after surgical procedures for empyema of the accessory cavities. The disturbances were of a metastatic nature, according to Alexander.

BOSSALINO (514, Hemorrhagic cysts of the frontal sinus) reports the case of a man of twenty-nine who had been struck on the right eye, two years before, by a large piece of iron. There was a persistent but reducible exophthalmus of 16mm. The eye was displaced outwards. The right frontal region was prominent. Below the upper wall of the orbit a deep swelling could be made out. An incision through the entire extent of the upper lid showed that the tumor involved the entire upper orbital wall and part of the outer wall as well. After the removal of a part above the upper lid, a cavity between the bones was laid bare, in which a brownish tumor was imbedded. This was extirpated, and recovery took place. Histologic examination showed that the mass was a blood cyst, which had

developed in the frontal sinus in consequence of an injury which the patient had suffered some time before. CIRINCIONE.

XI.—CONJUNCTIVA.

515. DIMMER, F. The etiology of spring catarrh. *Wiener klin. Wochensh.*, 2, 1905.
516. VERHOEFF, G., and DERBY, G. Pathologic histology of Parinaud's conjunctivitis. *Klin. Monatsbl. f. Augenh.*, xliii., i., p. 705.
517. SCHWARZ, O. Treatment of hay-fever conjunctivitis. *Muench. med. Wochensh.*, 1905, 22, p. 1040.
518. KUHN, T. Note on the treatment of hay-fever conjunctivitis. *Deutsche med. Wochensh.*, 1905, 34, p. 1345.
519. JENSEN, E. Cases of peculiar conjunctivitis. *Hospitaltid.*, p. 473, 1905.
520. LUNDSGAARD, K. Diplo-bacillus conjunctivitis and its treatment. *Hospitaltid.*, 1905, p. 249.
521. PFEIFFER, R., and KUHN, T. Note on the bacteriology of trachoma. *Zeitsch. f. Augenh.*, 13, 4, p. 321.
522. JUNIUS. On the diagnosis of trachoma. *Muench. med. Wochensh.*, 1905, No. 16.
523. TERTON, A. The contagion of trachoma. *Soc. d'opht. de Paris*, 14 Mars, 1905.
524. CHRIST. The etiology of croupous conjunctivitis. *Beitr. z. Augenh.*, No. 63, p. 11.
525. VILLARD, H. Tuberculosis of the conjunctiva. *Ann. d'oculist.*, cxxxiii., p. 271.
526. BALLABAN, TH. Hyaline degeneration of the ocular conjunctiva. *Arch. f. Augenh.*, lii., 1-2, p. 205.
527. RUMSCHEWITSCH, K. Amyloid degeneration of the upper fornix-fold of both eyes. *Westn. Opht.*, 1905, No. 3.
528. OETTINGER. Case of congestive hemorrhages of the face and conjunctiva after violent vomiting. *Deutsche med. Wochensh.*, No. 35, p. 1410, 1905.
529. DIETERICH, G. Report on lime-burns of the eye observed from 1893 to 1903. *In. Diss.*, Jena, 1905.
530. SACHSALBER, A. Etiology of pinguecula and pterygium. *Wiener klin. Wochensh.*, 1905, No. 8.
531. CARLINI, V. Angiomata of the conjunctiva. *Ann. di Ottalm.*, 5, 1905.
532. ISCHREY, T. On epibulbar carcinoma. *Zeitsch. f. Augenh.*, xliii., 5, p. 409.
533. v. HYMMEN, H. The oncology of the palpebral conjunctiva. 1. Lymphangioma cavernosum. 2. Round-cell sarcoma of the conjunctiva tarsi. *Klin. Monatsbl.*, xliii., 1, p. 512.

DIMMER (515, The etiology of spring catarrh) bases his views on the observations of the dermatologist, Kreibich, who describes

changes in the lid-fissure area of the conjunctiva resembling spring catarrh in three patients who suffered from skin eruptions due to the effect of strong sunlight. The conjunctival swelling disappeared in fourteen days under an occlusive bandage, and this was corroborated by another case. Dimmer believes that spring catarrh is caused by the chemical action of the sun's rays. Geographic studies of the occurrence of this disease show that it is rare in cloudy regions. In pinguecula, too, illumination is probably an etiologic factor.

VERHOEFF and DERBY (516, Pathologic histology of Parinaud's conjunctivitis) have made a further study of Parinaud's conjunctivitis which corresponds with their earlier findings. The most important change is a marked cell necrosis in the subconjunctival tissue with lymph-cell and phagocytic infiltration. There is also a chronic inflammatory reaction in the deeper tissues leading to organization and the production of new connective tissue. In their new case the necrosis was more marked and sharply defined. In the necrotic foci especially, which appear to the naked eye as little yellow areas, Verhoeff and Derby see the characteristic signs of Parinaud's disease. Goldzieher's terms of lymphoma, lymphoma-conjunctivitis and lymphadenitis are not appropriate. The correct view is that of Leber, who attributes the changes to lymphoid hypertrophy.

SCHWARZ (517, Treatment of hay-fever conjunctivitis), after using Dunbar's pollantin without any result, saw marked improvement of the conjunctival affection in hay-fever from the use of solutions of cocain and suprarenin.

KUHNT (518, Note on the treatment of hay-fever conjunctivitis) had a complete cure of conjunctivitis in hay-fever from insufflation of anæsthesin. It is to be noted that the nasal symptoms were also relieved by the treatment of the eye.

PFEIFFER and KUHNT (521, Note on the bacteriology of trachoma) made a filtrate from the fornix folds in trachoma, but were unable to infect the healthy conjunctiva with it.

CHRIST (524, The etiology of croupous conjunctivitis) observed five cases of croupous conjunctivitis, and considers it a definite clinical entity with pathognomonic symptoms. The present status of bacteriology does not invalidate this view or allow us to use a practical division of the various disease forms according

to their ætiologic factors. In spite of this, careful bacteriologic examination should be made in every case, as the germ etiology is of importance for treatment, prognosis, and prophylaxis.

VILLARD's (525, Tuberculosis of the conjunctiva) article is a complete review of the work on tuberculosis of the conjunctiva, the clinical manifestations, corneal complications, affections of the lachrymal passages and sclera, and the generalization of the disease.

BERGER.

BALLABAN (526, Hyaline degeneration of the ocular conjunctiva) extirpated a yellowish-red, hard, elastic tumor which had developed in the course of three months between the cornea and the external canthus, was 0.5 cm high, and freely movable on the sclera. Microscopic examination showed that the mass was conjunctiva in a state of hyaline degeneration. The hyaline lay principally in the walls of the vessels, but also between the connective-tissue fascicles. Ballaban makes a sharp distinction between hyalin and amyloid. He does not think it probable that there was a primary inflammation of a chronic type or that the vessels' walls produced hyalin. The latter was more probably deposited in the walls and gave rise to secondary inflammation.

SACHSALBER (530, Etiology of pinguecula and pterygium) finds that patients with pinguecula have not only been unusually exposed to sunlight, but that they must have been subjected to some special causes of chronic catarrh, as the latter complication is always present. As a further individual predisposition to pinguecula, Sachs alber is disposed to attach importance to the excessive development of lanugo hairs at the inner canthus.

CARLINI (531, Angiomata of the conjunctiva) describes a small globular tumor, about the size of a pea, attached by a short pedicle of conjunctiva to the upper margin of the tarsus. Microscopic examination revealed the structure of a cavernous angioma.

CIRINCIONE.

ISCHREYT (532, Epibulbar carcinoma) examined two epibulbar carcinomata which had extended about equally over the cornea and sclera. The first was, however, an epithelioma of horny consistency, a recurrence of a primary conjunctival carcinoma; the second a small-celled carcinoma, not horny, and a recurrence of a primary carcinoma of the lid with epibulbar proliferation. Ischreyt considers the question of the relation between

round-cell infiltration and epithelial proliferation. The latter seems to disperse the round-cell infiltration except in tissues, like the centre of the cornea, where there are no vessels, but the round-cell infiltration seems to prepare the way for the epithelial proliferation. Both specimens showed lymph-angiectasis. In one, cysts were found in the ciliary processes. Forty-seven cases are cited from literature in regard to the frequency of perforation of the globe in epibulbar cancer. The histologic structure seems a less decisive factor in this complication than the location of the new growth. The limbus is the most dangerous point of origin, and the perforating ciliary vessels the easiest site of perforation.

HYMMEN (533, The oncology of the palpebral conjunctiva) describes a rare lymph-angioma cavernosum, which had developed in the course of half a year in a woman of forty-one. It appeared on the conjunctival surface of the lower lid as a small flattened tumor, with a pedicle of dark-red hue and a grayish tip, which protruded between the closed lids. There was no recurrence after extirpation. The second case is also a curiosity. In a woman of eighty-one there appeared, after two extirpations of malignant growths, within two years, five small tumors on the conjunctival surface of the upper tarsus. These were 3 to 4mm broad and 2mm high, bled easily, and had the feel of cysts. They were dark red in color. There was a brownish pigmentation of a number of more or less distant points of the conjunctiva, and the centre of the cornea was eroded. Free extirpation extending into sound tissue was carried out, and no recurrence took place. Microscopic examination showed a large round-cell sarcoma of the submucous tissue, with slight pigmentation.

XII.—CORNEA, SCLERA, AND ANTERIOR CHAMBER.

534. DIMMER. A peculiar variety of corneal change (fold formation) following interstitial keratitis. *Zeitsch. f. Augenh.*, xiii., p. 635.

535. CONSIGLIO. A long interval between attacks of keratitis par-enchymatosa in the right and left eye. *Beit. z. Augenh.*, 63, p. 9.

536. DURANTE, F. Resection of the Gasserian ganglion. *Riv. Ital. di Ottalm.*, Naples, 5-6, 1905.

537. STEPHENSON, SYDNEY. Traumatic keratitis in the new-born. *Ophth'scope*, Jan., 1905.

538. DIMMER. On a form of corneal inflammation resembling keratitis nummularis. *Zeitsch. f. Augenh.*, xiii., p. 621.

539. WEHRLI, E. Nodular keratitis (Groenouw) a primary, isolated, chronic, tuberculous affection of the anterior layers of the cornea. *Lupus corneæ*. *Zeitsch. f. Augenh.*, xiii., 4, p. 322.
540. MANZUTTI, G. Another case of keratitis nodosa. *Ann. di Ottalm.*, 1-2, 1905.
541. CHESNEAU, M. Sclerosing parenchymatous keratitis of probably tuberculous nature. *Ann. di Ocul.*, lxxxiii., p. 412.
542. OPPENHEIMER, E. Varicella of the cornea. *Deutsche med. Wochensh.*, 1905, No. 21, p. 833.
543. HANKE, V. On the significance of annular abscess of the cornea. *Klin. Monatsbl. f. Augenh.*, xliii., 1, p. 724.
544. ZUR NEDDEN. On some rare bacteriologic findings in serpent ulcer. *Arch. f. Augenh.*, lii., 1-2, p. 143.
545. ERDMANN, P. Diplobacillus ulcer of the cornea. The resistance of the diplobacillus to desiccation in secretions. *Klin. Monatsbl. f. Augenh.*, xliii., 1, p. 561.
546. TERRIEN, F. Miliary abscesses developing in the corneal scar after cataract operation. *Arch. d'opht.*, xxv., p. 360.
547. SACHSALBER, A. Corneal changes in ulcerative processes. *Zeitsch. f. Augenh.*, xiii., p. 640.
548. TERSON, A. Gumma of the cornea. *Arch. d'opht.*, xxv., p. 265.
549. STOEWER. A new operation for keratoconus. *Klin. Monatsbl. f. Augenh.*, xliv., i., p. 474.
550. VALUDE, E. Keratoconus in pregnancy. *Riv. Ital. di Ottalm.*, No. 2, 1905.
551. GASPARRINI, C. Primary carcinoma of the cornea. *Ann. di Ottalm.*, 1-2, 1905.
552. GOLESCIANO. Relapsing scleritis. *Recueil d'opht.*, xxvii., 265.
553. EVANS, T. Hydatid cyst of the anterior chamber. *Ophth'scope* Jan., 1905.

DIMMER [534, A peculiar variety of corneal change (fold formation) following interstitial keratitis] found almost completely transparent posterior layers of the cornea folded in concentric semicircles on the posterior surface. The only way in which this was detected was in consequence of peculiar reflexes and refraction changes. It is probable that the deeper layers were swollen in the course of a parenchymatous inflammation, and that the thickened membrane was thrown into folds when the cornea cleared up.

CONSIGLIO'S (535, A long interval between attacks of keratitis parenchymatosa in the right and left eye) patient was eighteen when the right eye was affected by parenchymatous keratitis. The other eye was not involved until twenty-six years later.

DURANTE (536, Resection of the Gasserian ganglion) reports

the case of a woman who had had the Gasserian ganglion removed for obstinate neuralgia. On the next day the cornea, which had been left uncovered, showed infiltration and commencing ulceration. This promptly disappeared under hot compresses mydriatics, and a protective bandage. CIRINCIONE.

STEPHENSON (537, Traumatic keratitis in the new-born) reviews the literature and draws the following conclusions: (1) Almost all cases of traumatic keratitis in the newly-born were due to severe instrumental delivery. The injury is generally unilateral, and there are complications in the form of abrasions of the skin, bruises, subconjunctival and retinal hemorrhages, hyphæma, etc. (2) The form of the corneal opacity is more or less characteristic. Stephenson then reports the following case, the first to be seen at the Queen Charlotte's Hospital, although 1200 births take place there annually, and forceps delivery is performed in at least 10% of the cases, and corneal injuries are watched for. The mother was aged forty-one, and had a generally contracted pelvis. The forceps were applied with difficulty, one blade being in apposition to the outer angle of the left orbit. Over the left frontal bone a large bruise was found, with marked swelling of the lids. Next day the cornea was found to be uniformly smoky, and a subconjunctival hemorrhage was seen. The anterior corneal epithelium was stippled, like shagreen. No supuration had occurred. After ten days the only trace of an injury was a small linear opacity running vertically in the outer part of the cornea. Three months after birth this condition was found unchanged. A second case of this sort in a child of twelve is reported. The appearance of the opacity was characteristic, and on questioning it was found that a forceps had been applied at birth, and the head of the child badly bruised. Scars were still visible on the head, and there was marked irregular astigmatism. DEVEREUX MARSHALL.

DIMMER's (538, On a form of corneal inflammation resembling keratitis nummularis) not quite uniform cases showed pain, photophobia, and lachrymation, but without actual conjunctival secretion, followed by the development of peculiar infiltrates in the superficial layers of the cornea, but also in the middle layers, measuring 1mm to 1.5mm. The middle of the cornea was the principal seat of the affection. Toward the margin there is a more concentric arrangement, and in both locations a tendency

to confluence. The infiltrations are sharply defined ; the corneal tissue lying between the individual spots is occupied by a fine stippled opacity. While many of these foci are eventually absorbed, a development of round shallow ulcers is observed in others. The deeper structures of the eye are not affected, and vision may be normal in spite of the opacities. The clinical course of the disease is slow, sluggish, lasting for weeks. Compared with keratitis superficialis (Fuchs), k. maculosa (Reuss), and k. nummularis (Stellwag), the last-named affection shows the greatest correspondence.

WEHRLI [539, Nodular keratitis (Groenouw) a primary, isolated, chronic, tuberculous affection of the anterior layers of the cornea; lupus corneæ] observed a peculiar corneal affection with unusually chronic course, persisting for years. The central portion and most superficial layers were attacked by the formation of non-vascularized nodules, which lifted up the intact epithelium over large areas in irregular, isolated patches. The disease was bilateral. Both patients were brothers, and strong, otherwise healthy peasants, but there was a history of tuberculosis in early youth. After curetting large nodules, Wehrli was convinced that he had to deal with lupus of the cornea. The development of this affection is prevented by the antibacterial action of light, and can be favorably influenced by repeated paracentesis of the anterior chamber. Iodoform and tuberculin should also be administered.

MANZUTTI'S (540, Another case of keratitis nodosa) patient had photophobia with slight diminution of vision since six years. The conjunctivæ were normal. The cornea showed no changes at the periphery, but in the central portion there were very fine closely sown dots forming a disk of opacity over the pupillary area. The sensibility of the cornea was diminished at the centre.

CIRINCIONE.

OPPENHEIMER (542, Varicella of the cornea) describes the case of a child with varicella eruption on the cornea. There was a small vesicle of about pinhead size to which threads of mucus were attached. This broke down, later on, forming a shallow, grayish ulcer, which soon cleared.

HANKE (543, On the significance of annular abscess of the cornea) explains several points in his article on the significance of annular abscess of the cornea, which had evidently been misconstrued by Morax.

ZUR NEDDEN (544, Some rare bacteriologic findings in serpent ulcer) claims that it is not permissible to label a clinical picture of *ulcus serpens*, without further examination, as pneumococcus ulcer. He reports three cases in which, quite unexpectedly, the hay-bacillus (*B. subtilis*) was found instead of the pneumococcus. Even in these cases, keratotomy proved of service.

ERDMANN (545, Diplobacillus ulcer of the cornea. The resistance of the diplobacillus to desiccation in secretions) found in cases of diplobacillus conjunctivitis, the most common of the infectious forms, not only marginal corneal infiltrates and ulcers, but malignant types resembling hypopyon keratitis, and requiring to be treated accordingly. Other cases healed under very simple measures. A history of previous injury could only be obtained in a very few cases, but Erdmann thinks this factor was almost invariably present, the trauma having been forgotten on account of the length of time which had elapsed or perhaps, too, because it was apparently negligible. As even the deep ulcers heal most readily with zinc sulphate, Erdmann lays stress on the diagnostic importance of a bacteriologic examination. Even the seventh generation of diplobacilli is pathogenic for the healthy human conjunctiva. Interesting experiments with bits of linen cloth dipped in secretions containing the diplobacillus and allowed to dry showed that at room temperature these germs remain virulent for at least fifty-four hours and are capable of producing spores for eleven days. Diplobacilli were found, in cases of normal conjunctiva, as pathogenic germs in the nose and as harmless parasites on the conjunctiva.

TERRIEN (546, Miliary abscesses developing in the corneal scar after cataract operation) made experiments on dogs' eyes to study the course of healing of the corneal wound after cataract operation, and noticed the frequent occurrence of small miliary abscesses in the newly formed epithelium closing the section. These abscesses appear only in the days immediately following operation. There are no clinical symptoms. No cases have been observed in man, although it is possible that they may explain certain infections of the globe occurring without apparent cause.

BERGER.

SACHSALBER (547, Corneal changes in ulcerative processes), experimented on rabbits by inflicting wounds and corrosions of

the cornea and allowing the animals to die of inanition. The latter factor has the most adverse influence on the course of ulceration, without being able to prevent the reconstructive functions of the organism. In these cases there was a marked absence of circumcorneal injection and chemosis, with a peculiar dryness and dulness of the corneal surface. "Unintentional" suppuration was frequent. The physical tension to which the cornea is subject, has a marked influence on the form of the scar elements. The fixed corneal corpuscles which play the major rôle in scar formation, and where there are no vessels, act alone to form a scar in the stroma of the cornea, develop by multiplication of the nuclei alone, the protoplasm being formed by the newly formed nuclei. By mechanical pressure, the young, irregular fibrillæ are fitted to the general arrangement of the lamellæ. Sachs'alber then discusses changes of Descemet's membrane, and degenerative changes in the corneal scar.

In order to remove the diseased tissue in keratoconus and to attain as favorable conditions as possible for prompt healing of the defects, STOEWER (549, A new operation for keratoconus) removes the prominence with a knife, and covers it with a double conjunctival flap. After four months the corneal curvature was normal, and the seat of the conus was occupied by a grayish macula, which did not suggest in any way its origin from a conjunctival flap; vision had increased sixty-fold. Microscopic examination of the resected apex showed connective-tissue degeneration of the corneal lamellæ. Stower concludes that a chronic inflammatory process is the underlying cause of keratoconus. The epithelium was mostly normal, but thickened in a few places. There were a few cysts containing granular debris. Bowman's membrane was perforated at one or two points. In the tissue of the conus numerous fissures, probably lymph-spaces, were noticed.

VALUDE (550, Keratoconus in pregnancy) reports a case of double keratoconus occurring in the course of a pregnancy, which was undoubtedly due to the disturbances of nutrition consequent on gestation.

CIRINCIONE.

EVANS'S (552, Hydatid cyst of the anterior chamber) patient was a child of six from Sydney. In the anterior chamber there was a pearly-white cyst, apparently floating free. The cyst was removed as if it had been a cataract, and the child recovered.

Examination showed neither hooklets nor hydatid cysts, but the cyst wall was characteristic, and closely resembled that of a cysticercus.

DEVEREUX MARSHALL.

Sections XIII.—XVIII. Reviewed by DR. O. BRECHT, Stettin.

XIII.—LENS.

553. ZIRM, E. (Olmuetz). On our present knowledge of the nutrition of the lens. *Wien. klin. Wochensch.*, 1905, No. 12.

554. BUSINELLI. Artificial ripening of cataract. *Riv. Ital. di Ottalm.*, 5-6.

555. LEZENIUS. Etiology of zonular cataract. *St. Petersburg. med. Wochensch.*, 1905, No. 20-21.

556. ASK, F. The operative treatment of zonular cataract. *Klin. Monatsb. f. Augenheilk.*, xliii., 1, p. 480.

557. STEIN, H. Unilateral perinuclear cataract. *Beitr. z. Augenh.*, xliii., 1, No. 63, p. 42.

558. SEGAL-NOCHIM. On congenital perinuclear cataract. *In. Diss.*, Koenigsberg, 1905.

559. PASCHEFF. Iridotomy in cataract extraction. *Arch. d'opht.*, xxv., p. 244.

560. ALBERTOTTI. Treatment of cataract. *Festsch. f. Hirschb.*, 1905.

561. DUETZER, A. Choroidal detachment after cataract extraction. *In. Diss.*, Giessen, 1905.

562. CASALI, A. Ætiology of spontaneous dislocation of the lens. *Ann. di Ottalm.*, 5-6, 1905.

563. PETERS, A. The pathogenesis of cataract. *Klin. Monatsbl.*, xliii., 621.

ZIRM (553, On our present knowledge of the nutrition of the lens) reports having operated on six cases of tetany-cataract—four in women of about thirty. In every case there was this remarkable coincidence that the patients had lost their hair and nails, showing trophic disturbances of epithelial structures like the lens. Of the six cases, four were in the last months of pregnancy. The toxins causing the tetany were probably of uterine origin.

LEZENIUS (555, Etiology of zonular cataract) claims that zonular cataract may be congenital, but that in the great majority of cases it develops in the first year or two. Rachitis is an important etiologic factor by causing convulsions which lead to the formation of cataract.

HORSTMANN.

ASK (556, The operative treatment of zonular cataract)

opposes schematic treatment in zonular cataract, whether by iridectomy, discission, or extraction, and pleads for individualization. It is of importance to consider the patient's industrial future. Ask advises iridectomy if sufficient vision for the ordinary purposes of daily life can be obtained with the stenopæic slit under mydriasis with full correction of the ametropia. In case of high myopia, one lens is to be removed, allowing one eye to be used for near work and the other for distant vision. In high myopia and extensive opacity both lenses must, of course, be removed.

STEIN (557, Unilateral perinuclear cataract) reports five cases of unilateral perinuclear cataract. In one instance this change was directly due to a mechanical injury. In the other cases the zonular cataract was a secondary development, as clear lens fibres developed about the cloudy nucleus. HORSTMANN.

ALBERTOTTI'S (560, Treatment of cataract) article is a translation of a work by Marco da Sarano on the treatment of cataract, written in the fifteenth century. HORSTMANN.

DUETZER (561, Choroidal detachment after cataract extraction) reports two cases of choroidal detachment and one of choroidal prolapse after cataract extraction. The rarity of this complication in the Giessen clinic is explained by the uniform employment of the pressure bandage after operation.

CASALI (562, *Ætiology of spontaneous dislocation of the lens*) reports a case of complete bilateral dislocation of the lens in an emmetropic eye, in an individual of seventy. There was no history of previous disease or injury of the eye. In regard to the etiology of this case and of others of spontaneous luxation, the author attaches importance to the agency of general arteriosclerosis, which leads to fluidification of the vitreous and weakening of the zonule. CIRINCIONE.

XIV.—IRIS.

564. FEJER, J. Developmental anomalies of the iris. *Arch. f. Augenh.*, lii., 16.

565. GENDRON. Relapsing gonorrhœal iritis. *L'opht. provinc.*, 1905, 1.

566. BAYLAC. Double iritis in a case of gonorrhœal infection. *Clinique opht.*, 1905, p. 84.

567. CAMPBELL. Iritis due to oral sepsis. *Lancet*, 1905, p. 4275.

568. WOELFFLIN, E. Pathogenesis of cysts of the iris angle. *Arch. f. Augenh.*, lii., p. 223.

569. STOCK, W. Epithelial tumor of the iris, originating in the posterior pigment epithelium. *Klin. Monatsbl. f. Aug.*, xliii., p. 503.

570. CUTLER, C. Metastatic carcinoma of iris and ciliary body. *ARCH. OF OPHTH.*, xxxiv., 4, p. 392.

FEJER (564, Developmental anomalies of the iris) describes an extensive ectropium uveæ in an otherwise normal eye of a girl aged six, and lays stress on the fact that the brown zone about the pupil is thickened, and not thinned, as claimed by some authors. A histologic examination could not be made.

CAMPBELL (567, Iritis due to oral sepsis) reports three cases of iritis in which syphilis, rheumatism, and tuberculosis could be excluded. The oral cavity was in a very bad state of sepsis. After this had been cured the iritis disappeared.

HORSTMANN.

WOELFFLIN (568, Pathogenesis of cysts of the iris) describes cysts of the anterior chamber in the eye of a man of twenty-five, who had received a penetrating punctured wound of the globe eighteen years before. A peculiar feature was the development of a cyst of the wound canal of the sclera communicating with the anterior and posterior chamber. Woelfflin follows Rothmund's theory of the development of these cysts from inversions of the endothelial lining.

STOCK (569, Epithelial tumor of the iris) describes a tumor which he believes to have been a papillary epithelioma. It appeared to grow from the posterior surface of the iris, projecting beyond the pupillary margin, and remaining unaltered in size during the six weeks it was under observation. The patient, a man of forty-six, died of pulmonary tuberculosis.

CUTLER (570, Metastatic carcinoma of iris and ciliary body) observed a gray mass in the iris of the left eye of a woman, aged thirty-three, after the removal of a carcinoma of the breast. General malignant disease had already developed. Histologic examination of the globe revealed a carcinoma of the iris and ciliary body, of rather complex, atypical structure.

ABELSDORFF.

XV.—CHOROID.

571. OHM, J. On rupture of the choroid. *In. Diss.*, Giessen, 1905.
572. DE LAPPERSONNE. Rupture of the choroid. *Riv. Ital. di Ottalm.*, 5-6, 1905.
573. AXENFELD. Solitary tuberculosis of the choroid. *Med. Klinik*, 1905, 16.
574. MANCH, J. Benign, non-progressive tumor-like structure in the fundus. *Klin. Monatsbl. f. Aug.*, xlii., p. 649.
575. OELLER, J. Double carcinoma of the choroid with cure in the right eye of a detachment of the retina which had affected both eyes. *Arch. f. Augenh.*, lii., p. 121.
576. GELPKE. Case of metastatic carcinoma of the choroid. *Klin. Monatsbl. f. Aug.*, xliii., p. 492.
577. POPOW, W. A neglected case of melanosarcoma of the choroid. *Westn. Ophth.*, 1905, 3, 276.
578. GRIMBACH, R. Clinical study and prognosis of uveal sarcoma. *In. Diss.*, Giessen, 1905.
579. FEHR. Angioma of the choroid. *Centralbl. f. prakt. Augenh.*, xxix., 161.
580. SANTUCCI, J. Pathologic and histologic changes in suppurative choroiditis. *Ann. di Ottalm.*, 5-6, 1905.

OHM (571, Rupture of the choroid) gives a review of our present knowledge of rupture of the choroid, and reports in detail five cases observed at the Giessen eye-clinic.

MANCH (574, Progressive tumor-like structure in the fundus) reports the case of a girl of eighteen, who had been under observation for seven years. On the otherwise normal papilla there was a shiny, bluish-white connective-tissue deposit. At the macula there was an intensely black round spot, surrounded by a washed-out area of much lighter color, and irregular pigment deposits. Three disk-widths farther to the temporal side there was a tumor-like structure running forward horizontally to the extreme limit of the visible fundus. The growth was grayish-white, solid, and apparently immovable, covered by the retina, and showing several pigment patches and white areas of atrophy. The picture remained unchanged during seven years. The process probably began in the choroid and affected the retina secondarily.

HORSTMANN.

OELLER (575, Double carcinoma of the choroid with cure in the right eye of a detachment of the retina which had affected both eyes) reports the case of a woman of forty-seven, who developed carcinoma of the choroid four years after an operation

for cancer of the breast. The growth was the usual one, which had become epibulbar in the right eye, and had proliferated into the optic nerve of the left. In the right eye, repeated incisions according to Deutschmann's method were followed by a reattachment of the retina in places.

GELPKE (576, Case of metastatic carcinoma of the choroid) reports the interesting case-history of a woman of fifty-one, who had suffered for years with a goitre. This underwent cancerous degeneration, and metastasis took place in the left eye, the lungs, bronchial glands, pleura, liver, spleen, and kidneys. The carcinoma of the choroid was not disciform, as usual, but projected out into the vitreous.

FEHR (579, Angioma of the choroid) describes an angioma of the choroid, which had been kept under ophthalmoscopic observation for twenty years. At first the picture was that of a flat, nodular, grayish-white tumor, with glittering spots, about 5×3 p. d. in size, and 0.6–1.2 mm high. The mass gradually increased in size, and the eye was lost without inflammatory signs. When the latter appeared the globe was removed. A disciform angioma was found, measuring $12 \times 6 \times 3$ mm, and surrounded by a dense fibrous capsule. The differential diagnosis between angioma, sarcoma, and solitary tubercle is of practical importance. The angioma is distinguished from the last by gradual onset, remaining stationary for a long time, without inflammatory reaction or miliary tubercles in the neighborhood. Color alone is the means of excluding a sarcoma. The latter generally has a brown, yellow, or variegated hue, while angioma is white or bluish-white, on account of the thick capsule.

XVI.—VITREOUS.

581. PATTERSON. Concerning the relationship of nasal disorders to vitreous opacities. *Ophth. Record*, 1905, p. 105.

582. PATON and PARAMORE. Vitreous hemorrhages. *Lancet*, 1905, p. 4287.

PATON and PARAMORE (582, Vitreous hemorrhages) observed that vitreous hemorrhages, which occur in healthy young persons, are accompanied by an increased coagulability of the blood. In such cases the administration of citric acid is indicated, while treatment with calcium salts is irrational. HORSTMANN.

XVII.—GLAUCOMA.

583. MASLENIKOW, A. Diurnal variations of tension in glaucoma. *Westn. Ophth.*, 1905, No. 3, p. 237.
584. LEBER, TH. On filtration in the eye and its rôle in the pathogenesis of glaucoma. *Ann. d'oculist.*, cxxxiii., p. 401.
585. HEINE. Cyclodialysis, a new operation for glaucoma. *Deutsche med. Wochenschr.*, 1905, No. 21.
586. HABERKAMP. The simplest glaucoma operation. *Ophth. Klinik*, 129, 1905.
587. CHENCY. The question of iridectomy in glaucoma simplex. *Ophthalmology*, 1905, p. 412.
588. HAMILTON. Note on the treatment of simple glaucoma. *Ophthalmoscope*, 1905, p. 225.

MASLENIKOW (583, Diurnal variations of tension in glaucoma) raises the question whether pressure in glaucoma remains unchanged in the course of the day, or whether there are diurnal variations depending on certain periodicity of organic phenomena, such as pulse, respiration, arterial pressure, etc. A series of tonometric tests was made with Maklakow's tonometer in normal eyes, and in twenty-two with glaucoma. The tests were made regularly every morning and night. Tension of the glaucomatous eyes was determined before and after myotics, and before and after iridectomy. Tension was found to be higher in the morning, but in normal eyes the difference is slight or inappreciable. In no case was the evening tension higher. In glaucoma, the morning tension is also higher than at night, but the difference is marked, up to 22mm Hg. Myotics and iridectomy lower the absolute tension, but the amplitude of the diurnal variation remains greater than in the normal eye. In glaucoma the apparatus for regulating tension is disturbed. In testing the effect of drugs or surgical procedures on the tension, these diurnal variations should not be left out of the reckoning.

HIRSCHMANN.

LEBER (584, On filtration in the eye and its rôle in the pathogenesis of glaucoma) defends the accuracy of his filtration manometer against the attacks of Troncoso. The values which Leber found for the physiologic filtration of the eye with injections into the anterior chamber must be nearly exact. Troncoso claims to have found that filtration is slower if an albuminoid fluid is used than when normal saline is employed, and that there is a

high percentage of albumen in the aqueous of glaucomatous eyes. Accordingly Troncoso concludes that glaucoma is due to the high percentage of albumen and the consequent difficulty of filtration. Leber answers this by showing that there is a marked increase of the albumen content in many intraocular inflammations associated with decrease of tension, such as panophthalmitis, irido-cyclitis, detachment, etc. Specimens of these diseases remind one of boiled white of egg. Leber has never seen anything similar in glaucoma. BERGER.

HEINE (585, Cyclodialysis, a new operation for glaucoma), basing on Fuchs's observation of choroidal detachment after iridectomy for glaucoma, has devised a new operation, cyclodialysis, to establish an artificial communication between the anterior chamber and the suprachoroidal space. A conjunctival flap is made, and a scleral section 1-2mm long made with a lance knife about 4-5mm back of the limbus. An ordinary stilet is then carried forward under the sclera until it reaches and perforates the ligamentum pectinatum. The instrument must now appear in the anterior chamber. It is then withdrawn slowly. The aqueous does not escape at once, but there is a gradual backward flow in the course of two or three days. If immediate flow is desired, the stilet is pushed toward the interior of the globe. The conjunctival wound is closed, and the operation is ended. Heine has tried this procedure on twenty eyes, all of which, however, were either quite blind or nearly so. The results were encouraging. The details are to appear later.

XVIII.—SYMPATHETIC OPHTHALMIA.

589. FUCHS, E. Sympathetic inflammation, with remarks on serous traumatic iritis. *v. Graefe's Arch.*, lxi., 2, p. 365.

590. HIRSCHBERG, J. Operation of soft cataract (sympathetic), with notes on sympathetic ophthalmia. *Centralbl. f. prakt. Aug.*, xxix., p. 97.

591. PIHL, A. Cases of sympathetic ophthalmia, with histologic examinations. *v. Graefe's Arch.*, lx., 3, p. 528.

FUCHS (589, Sympathetic inflammation, with remarks on serous traumatic iritis) examined thirty-five eyes which had been affected with sympathetic ophthalmia as proven by clinical and histologic observation. This affection occurs in about 13% of all eye injuries, and is cured in 9% of the cases. The histologic changes in the first affected eye in true sympathetic ophthalmia of the

second eye were characteristic, and consisted in small-cell infiltration, most marked in the choroid, less in the ciliary body, and least in the iris. This was missing in all but a single case of sympathetic irritation. Bacteria were invariably absent. The method of propagation to the sympathizing eye is still in doubt. The optico-ciliary paths have been definitely excluded by histologic investigations. Berlin's theory of metastasis by blood-vessels is the most probable hypothesis. The diagnosis in the living, injured eye is still very difficult, so that enucleation seems the most rational procedure in case of doubt in every ominous case.

HIRSCHBERG [590, Operation of soft cataract (sympathetic), with notes on sympathetic ophthalmia] describes a case of sympathetic ophthalmia, and calls attention to the special difficulties of cataract extraction under these circumstances. He gives a number of interesting descriptions of fundus changes in sympathetic ophthalmia.

PIHL (591, Cases of sympathetic ophthalmia, with histologic examinations) saw nine cases of sympathetic ophthalmia in 13,750 patients. There was one case of true papillitis, one of papillitis and chorio-retinitis, one of plastic chorio-retinitis and vitreous exudation, or uveitis posterior, two cases of mild serous iritis, and four of severe fibrinous irido-cyclitis. In regard to treatment, Pihl believes in the prompt enucleation of the originally affected eye even after outbreak of symptoms of sympathetic involvement of the other, even if there is still some vision. This prevents any more microbes and toxins from getting into the other eye.

HORSTMANN.

Sections XIX.—XXII. Reviewed by DR. H. MEYER,
Brandenburg.

XIX.—RETINA AND FUNCTIONAL DISTURBANCES.

592. ZIRM, E. A case of persistent and extensive changes at both maculæ caused by direct sunlight. *v. Graefe's Arch.*, lx., 3, 401.

593. POSSEK, R. On senile changes at the macula in arteriosclerosis. *Zeitsch. f. Augenh.*, xlii., p. 771.

594. TERWALP, A. Opaque nerve fibres in the retina. *In Diss.*, Giessen, 1905.

595. WEHRLI, E. Microgyria and macrogyria of the brain and analogous arrest of development in the retina. Epithelial rosettes

and the pathology of glioma of the retina. *v. Graefe's Arch.*, lx., 2, 302.

596. KRUECKMANN, E. Pigmentation and proliferation of the retinal neuroglia. *v. Graefe's Arch.*, lx., 2, 350.

597. WIRTH, J. Two cases of glioma retinae, with peculiarities. *In. Diss.*, Berlin, 1905.

598. KASSIL, A. Case of glioma of the retina. *Westn. Ophth.*, 1905, No. 3.

599. HILBERT, R. On subjective vision of colored spots in the field as a pathologic and physiologic phenomenon. *Klin. Monatsbl.*, xliii., 1, p. 751.

600. HILBERT, R. Violet vision. *Centralbl. f. prakt. Augenh.*, xxix., p. 135.

601. HEINRICHSORFF, P. Disturbances in adaptation and visual field in hemeralopia. *v. Graefe's Arch. f. Augenh.*, lx., 3, p. 405.

602. SANTOS, FERNANDEZ. Total congenital detachment of the retina in two brothers. *ARCH. OF OPHTH.*, xxxiv., 4, 338.

603. FRIDENBERG, PERCY. Fibrillary œdema of the retina following contusion. *ARCH. OF OPHTH.*, xxxiv., 4, p. 331.

604. OATMAN. Cysts of the pars iridica retinae, with report of a case. *ARCH. OF OPHTH.*, xxxiv., 3, p. 252.

605. SNELL, SIMEON. The duration of life after the appearance of albuminuric retinitis. *The Lancet*, July 15, 1905, p. 154.

ZIRM (592, Case of persistent and extensive changes at both maculae caused by direct sunlight) observed permanent changes at the macula of both eyes in a boy who had, as he stated, gazed at the sun for several minutes. Vision was reduced in both, to counting fingers at 5m. The ophthalmoscope showed an elliptical ring-shaped area, with a finely stippled granular ground. The ring was grayish-black in color, and interrupted in certain places. Injections of cyanide of mercury (1. 5000) with acoin improved the vision slightly.

POSSEK (593, On senile changes at the macula in arterio-sclerosis) reports a case of senile disease of the macula, with central scotoma and diminished vision, without any other ocular disease, in the right eye. In the left there were vascular changes, such as thickening of the walls and tortuosity of the small vessels of the macular region. The latter were discolored and prominent. The author thinks there was retinal disease on a basis of arterio-sclerosis. The prominence of the macula is ascribed to a thickening of the retina, atheromatous changes in the choriocapillaris and neighboring vessels, and possible proliferation of a newly-formed layer of tissue between the retina and the choroid.

TERWALP (594, Opaque nerve fibres in the retina) has collated the cases of opaque nerve fibres from various clinics, particularly that in Giessen. The marked differences in percentage and occurrence are probably due to the fact that all cases are not examined ophthalmoscopically. Terwalp concludes that the occurrence of opaque nerve fibres does not depend on any congenital predisposition or developmental arrest, but is to be considered as an anomaly which is not necessarily present even at birth, but to which there is a certain predisposition at birth.

WEHRLI (595, Microgyria and macrogyria of the brain and analogous arrest of development in the retina. Epithelial rosettes and the pathology of glioma of the retina) observed a child with microgyria for a short time. Its twin was normal. The histologic examination showed an abnormally thin, hypoplastic retina, containing a tumor, composed of axis-cylinders and numerous longish cells not found in the normal retina. In the brain there were unusually small gyri and convolutions and cellular elements which were not definitely developed and also displaced. The developmental defect was due to congestion in the cervical vessels. The "micro retina" has small cellular elements. The rosettes found in the tumor were due to folding, while otherwise, typical rosettes after birth are due to pathologic processes. Some of the rosettes in glioma are identical with those of microphthalmus. The disturbance of development from which glioma arises consists in a dispersion of undifferentiated glia elements and ganglion cells. Hemorrhage or some other lesion is then necessary to stimulate reparative proliferation of the partially developed cells. As no blood extravasates were found in prematurely born children, the latter would be a prophylactic measure against glioma where the family history suggested danger of its occurrence. Wehrli suggests the name, "traumatic neuro-glioma."

KRUECKMANN (596, Pigmentation and proliferation of the retinal neuroglia) made histologic examinations with a new and as yet unpublished *alsol-hæmatoxylin* method, and came to the conclusion that the entire retinal neuroglia tissue is a single connected mass. In regard to the physiologic relation of the vessel walls to their limiting membranes of glia tissue, Krueckmann believes with Graeff that the vessels do not consist of a single

endothelial tube, but of two such, one within the other, and loosely connected. This division into a vessel wall and a perivascularis could rarely be seen in arteries. The opposed surfaces of the two tubes are smooth, and separated by a space, which in life is usually invisible. In globes with beginning panophthalmitis the vessel walls were found to be dissected up by leucocytes, and these spaces of his enlarged. The existence of endothelial cells on the inner surface of the retina, *i. e.*, that nearest the vitreous, has not been proven. There is no free pigment in the ectodermal elements of the retina, the coloring matter being invariably bound to the protoplasma of the glia cells or to the vascular apparatus. In chronic disease of the retina, pigment invasion takes place in the form of granules and larger masses infiltrating the pathologically increased protoplasm of the glia cells, which appears in the form of compact nodular masses. In this way the various stages from black to intense white are produced in the ophthalmoscopic picture.

WIRTH (597, Two cases of glioma retinae, with peculiarities) studied two cases of glioma. In the first, the embryonic pre-disposition or rudiment was directly observed, as the glioma was seen within three days after birth. In the other case numbers of Wintersteiner's rosettes were seen, and the question of their pathogenesis is discussed. In one place the basal lamina was perforated, corroborating Michel's view, which had been declared to be impossible by Wintersteiner.

HILBERT (599, On subjective vision of colored spots in the field as a pathologic and physiologic phenomenon) reports a number of cases, fifteen in all, from the literature, in which there were subjective sensations of colored spots in the visual field. To these he adds two which he observed himself. The phenomenon may be physiologic or pathologic. In the first instance, the colored figures are geometrically regular and only temporary. The pathologic variety is of central origin. Nothing is known as to the organic basis.

HILBERT (600, Violet vision) found six cases in literature in which there was mention of violet vision in the form of spots or clouds. The diseases in which this symptom occurred were very varied, including intoxications, tabes, disseminate choroiditis, otitis media, and, in one case observed by Hilbert himself, influenza. The symptom is one of central origin.

HEINRICHS DORFF (601, Disturbances in adaptation and visual field in hemeralopia) determined the adaptation-time in hemeralopes by Piper's method, and found it invariably approximately normal in all chronic forms of this affection. In acute hemeralopia alone the time is doubled. Annular scotoma is not an occasional and accidental, but the invariable and typical disturbance of the visual field in true hemeralopia, which depends on an affection of the rods. It can be recognized in all light cases and in those severe ones in which the periphery is still preserved. Concentric contraction is a secondary complication of the severe cases.

FERNANDEZ (602, Total congenital detachment of the retina in two brothers) describes an opacity situated behind the pupil, which he observed in two brothers, aged three and a half years and one and a half months, which he diagnosed as congenital detachment of the retina, without giving any further details of the cases or of the clinical examination.

ABELSDORFF.

FRIDENBERG (603, Fibrillary œdema of the retina following contusion) reports another case of the condition which he has previously described as fibrillary œdema of the retina following contusion of the globe. There was no diffuse œdema in the sense of Berlin's opacity, the changes being limited to the macula and appearing as glittering white radii arranged about the fovea in the form of a sunburst. The appearance suggested the aurora. The individual white lines were separated by spaces of apparently normal, bright red retina. The picture is construed as due to an œdema of the nerve fibres only, without transudation into the parenchyma of the retina, and an analogy is pointed out in the clinical manifestation and pathogenesis of this condition to opaque lens fibres. Fridenberg claims that there is also an analogous later change consisting in an eventual sclerosis of the nerve fibres, which he has also described, in which the fibres appear as exceedingly fine, intensely white striæ, like opaque nerve-fibres, but separated by areas of red retina. The picture is that of the whisker-like radiations from the disk in the rabbit. These conditions were invariably due to direct injury or to hemorrhage and subsequent scar, implicating the superficial layer of the retina.

ABELSDORFF.

OATMANN (604, Cysts of the pars iridica retinae, with report of a case) enucleated an eye which was blind from glaucoma.

The histologic examination revealed a serous cyst of the posterior surface of the iris, the anterior wall being formed by the atrophic iris, and a front layer of the pigment epithelium; the rear wall, by the posterior pigment and by a fibrous membrane formed by the organization of exudates. The contraction of this exudate seems to have caused traction and separation of the two layers of the pigment epithelium of the rigid iris, which led to cyst formation.

ABELSDORFF.

XX.—OPTIC NERVE.

606. GROENOUW. Intrasccleral nerve loops. *Klin. Monatsbl.*, xliii., 1, p. 637.
607. OGAWA, K. Pigmentation of the optic nerve. *Arch. f. Augenh.*, lii., 4, p. 437.
608. PATRY, A. A clinical type characterized by optic neuritis and cranial deformity. *Ann. d' ocul.*, cxxxiii., p. 249.
609. NAGEL, W. Remarks on disturbances of macular color perception in retrobulbar neuritis. *Klin. Monatsbl.*, xliii., 1, p. 742.
610. KIPP, C. Two cases of anomalies of the vascular system of the optic papilla. *ARCH. OF OPHTH.*, xxxiv., 3, p. 256.
611. PONEK, R. Cortical hemianopsia following injury. *Zeitsch. f. Augenh.*, xiii., p. 794.
612. PANKSTAT. Contribution to the study of bitemporal hemianopsia. *Klin. Monatsbl.*, xliii., 1, p. 605.
613. SACHSALBER, A. Case of occipital encephalocele with histologic examination of the optic nerve. *Zeitsch. f. Augenh.*, xiii., p. 711.
614. SACHSALBER, A. Disappearance of medullated nerve-fibres in the retina in neuritic atrophy due to brain tumor. *Zeitsch. f. Augenh.*, xiii., p. 739.
615. FLATAU, G. On the retrogression of choked disk in brain tumor. *Muench. med. Wochensch.*, 1905, p. 646.
616. STOCK. Case of post-papillary gumma of the optic nerve and gummatous choroiditis. *Klin. Monatsbl.*, xliii., 1, p. 640.
617. SCHULTZ-ZEHDEN, P. Contribution to the pathogenesis of unilateral choked disk. *Klin. Monatsbl.*, xliii., 1, p. 153.

GROENOUW (606, Intrasccleral nerve loops) examined a globe which it was claimed had been injured by an arrow. Under the microscope, loop formation was found in a posterior ciliary nerve. This surrounded a blood-vessel. Either the nerve had carried the vessel forward with it, or *vice versa*, depending on which structure developed the earlier. This question is not decided.

OGAWA (607, Pigmentation of the optic nerve) examined the optic nerve of animals, and corroborates the view that pigmentation of the trunk of the nerve is frequent. A number of

cases of physiologic pigmentation of the nerve in man have been described with ophthalmoscopic and histologic examination. Ogawa believes that there is a congenital rudiment of pigment spots, originating in hypertrophy of individual pigment cells or in scattered embryonal masses. The cases of pathologic pigmentation of the optic nerve, to which Ogawa adds one observed and examined histologically by himself, are due to a deposit of hæmosiderin.

NAGEL (609, Remarks on disturbances of macular color perception in retrobulbar neuritis) examined a patient with his apparatus, with beginning multiple sclerosis, relative color scotoma, and scotoma for white. There was diminished sensibility for green, which was confounded with gray. Red was recognized promptly. There is an analogy between the color perception of the pathologically color-blind fovea in this case, and the physiologically, partially color-blind zone of the retina. It appears quite evident that loss of perception of red and of green are not necessarily associated.

KIPP (610, Two cases of anomalies of the vascular system of the optic papilla) reports the case of a boy of fifteen, in whose right eye the inferior nasal branch of the central artery of the retina protruded from the disk *2mm* into the vitreous, then returned to the level of the disk, and ran off into the retina. In the left eye the central artery could not be seen on the disk, as the vessel came to the surface at the margin of the papilla, above and below.

ABELSDORFF.

PONEK'S (611, Cortical hemianopsia following injury) patient was struck with an axe on the back of the head. He returned to consciousness with double vision. A trephining operation was performed and a celluloid plate applied in place of the depressed bone-splinter which had been removed. After this procedure, complete blindness set in and lasted for eight weeks. The final result was homonymous hemianopsia and vision reduced to one-half in both eyes. Ponek reviews the various theories as to the representation of the macula in the cerebral cortex, and their bearing on the symptoms in this case.

PANKSTAT (612, Contribution to the study of bitemporal hemianopsia) reports three cases of bitemporal hemianopsia observed by himself. The first, which was kept under con-

tinuous observation until death took place, was due to a cyst on the floor of the third ventricle. The second case was probably due to a glioma; the third, also to a tumor. Pankstat calls attention to the marked changes in vision (from counting of fingers to 1/10-2/10) and limits of the visual field, an observation which Oppenheimer has also made in brain syphilis. Improvement in vision was invariably accompanied by corresponding change in the color fields.

SACHSALBER (613, Case of occipital encephalocele with histologic examination of the optic nerve) examined the cadaver of a newly-born child with occipital encephalocele. Histologic examination showed the optic nerves to be unusually thin and dense. The nerve tissue was gone, having been replaced by a very delicate fibrous tissue. The ganglion cell layer was thinned out. This supports the view that centripetal paths leading to undeveloped centres remain undeveloped themselves. The basal ganglia, optic thalamus, etc., being undeveloped, no nerve fibres developed from the ganglion cells of the retina, and these structures themselves remained undifferentiated. The cells which did develop remained in a stage of incomplete finish. In other cases of anencephaly, the pupillary membrane and hyaloid artery were persistent. In this case there is no indication of either, but the vessels on the disk are unusually large, although not more numerous than normally. The central retinal artery is exceptionally narrow, and the cilio-retinal vessels show a compensatory development.

SACHSALBER (614, Disappearance of medullated nerve-fibres in the retina in neuritic atrophy) reports a case of brain tumor, in which amaurosis developed under the guise of bitemporal hemianopsia without visible fundus changes. The descending atrophy involved a sector of medullated nerve-fibres, which were present, so that eventually only striæ of proliferating interstitial tissue remained. In Wagenmann's case there was simple atrophy; here there was a descending post-neuritic process. The atrophy was preceded by total loss of function of the nerve fibres, and in spite of the interruption of the conduction there was complaint of tormenting hallucinations of sight. Sachs alber explains this symptom as due to irritative conditions in the cortex, due to inevitable changes in intracranial pressure from the growth of the tumor, or possibly

to inflammatory changes in the optic nerve causing cortical irritation.

FLATAU (615, On the retrogression of choked disk in brain tumor) observed symptoms of cerebral compression which were attributed to meningitis, in the case of a girl of sixteen, convalescing from typhoid. The autopsy revealed a cerebellar tumor. Nine lumbar punctures were performed, producing temporary relief of choked disk on each occasion. Flatau accordingly recommends lumbar puncture as a means of retarding optic atrophy in suitable cases of brain tumor, and as a therapeutic agent in all other cases of choked disk.

STOCK (616, Case of post-papillary gumma of the optic nerve and gummous choroiditis) made a histologic examination of a gummous tumor. The case is particularly interesting on account of the rarity of the localization of specific granulation tumors in the nerve head. The author compares his case to those previously reported by Wagner and by Juler.

SCHULTZ-ZEHDEN (617, Contribution to the pathogenesis of unilateral choked disk) saw a patient with genuine, simple atrophy in the right eye, and choked disk in the left. The organic basis was found, on autopsy, to be a cholesteatoma, which had destroyed the right thalamus and pressed the trunk of the right optic nerve directly at the chiasm, producing pressure atrophy. The choked disk on the left side was due to increased intracranial pressure.

XXI.—INJURIES, FOREIGN BODIES, AND PARASITES.

618. VAN DUYZE. **Retrobulbar wound of the optic nerve by a pellet of lead.** *Riv. Ital. di Ottalm.*, No. 3, 1905.

619. SACHSALBER, A. **Gunshot wound of both optic nerves with protracted amaurosis and eventual partial recovery of peripheral vision.** *Zeitsch. f. Augenh.*, xliii., p. 727.

620. HORNSTEIN, F. **Injury of the eye with splinters of copper and brass.** *In. Diss.*, Tuebingen, 1905.

621. CRAMER, E. **On the healing of siderosis bulbi.** *Klin. Monatsbl.*, xliii., 1, p. 757.

622. GUILLERY. **Injury as a cause of a constitutional eye affection.** *Klin. Monatsbl.*, xliii., 1, p. 630.

623. SCIMEMI, E. **Extraction of subretinal cysticercus, and methods for determination of its location.** *Ann. di Ottalm.*, 3, 1905.

VAN DUYZE (618, Retrobulbar wound of the optic nerve by a

pellet of lead) reports a case which is interesting in that there was pallor of the temporal half of the nerve within five days after injury of the non-vascular portion of the optic nerve. Within eight days the entire disk had lost its rosy hue, and appeared white (Waller's atrophy). CIRINCIONE.

XXII.—OCULAR DISTURBANCES IN GENERAL DISEASE.

624. HOBHOUSE, E. Renal retinitis in a child of six and a half years with interstitial nephritis. *Ophthalmoscope*, April, 1905.

625. CHRONIS, D. A case of irido-cyclitis during pertussis. *Klin. Monatsbl.*, xliii., 1, p. 663.

626. FORTUNATI, A. A morbid ocular phenomenon following influenza. *Riv. Ital. di Ottalm.*, 4, 1905.

627. HEINE. Ocular disturbances in cerebro-spinal meningitis. *Klin. Wochens.*, 1905, No. 25.

628. CONTRELLEMENT, V., and GALEZOWSKI, J. Post-meningitic papillary stasis; recovery. *Rec. d'ophth.*, xxvii., p. 217.

629. MENETRIER and BLOCH. Weber's syndrome caused by a tumor of the temporo-sphenoidal lobe. *Soc. m  d. de h  pit. de Paris*, 13 Jan., 1905.

630. GALEZOWSKI, J. The development of amaurosis in tabes. *Rec. d'ophth.*, xxvii., p. 271.

631. FORTUNATI, A. Histologic study of a case of quinine amaurosis. *Riv. Ital. di Ottalm.*, No. 1, 1905.

632. OGG, T. Case of acute plumbic encephalopathy followed by muscular paralysis and optic neuritis. *Clin. Jour.*, Nov. 30, 1905.

633. REICHARDT, M. The development of cerebral compression in tumor and other affections of the brain, with a new form of brain swelling. *Deutsche Zeitsch. f. Nervenheilk.*, vol. xxviii.

HOBHOUSE (624, Renal retinitis in a child of six and a half years with interstitial nephritis) reports the case of a child, which at three had had scarlet fever followed by   dema of the feet and legs. In the last four months the child had suffered with headaches, and later with convulsions. The urine contained small quantities of albumen, and later of blood. It was of a portwine color, but not cloudy. No casts were found. Characteristic changes then appeared in the fundus. After death the kidneys were found markedly affected, evidently as a result of the acute or subacute nephritis, with changes in the glomeruli.

DEVEREUX MARSHALL.

CHRONIS (625, A case of irido-cyclitis during pertussis) reports a case of irido-cyclitis with final loss of vision, caused by per-

tussis. This diagnosis was made probable by the exclusion of all other etiologic factors.

FORTUNATI (626, A morbid ocular phenomenon following influenza) reports three cases of cyclitic inflammation due to influenza. There were sharply-defined foci of congestion with episcleral hyperæmia, disturbance of pupillary reaction, and pain on pressure, and, above all, on attempts at accommodation.

CIRINCIONE.

HEINE (627, Ocular disturbances in cerebro-spinal meningitis) studied 100 cases of epidemic cerebro-spinal meningitis. There were ocular complications in twenty-seven. Affections of the optic tract consisted in simple neuritis, basilar amaurosis without ophthalmoscopic changes, and very rarely cortical disturbances. The interior of the globe may be affected by metastatic iritis, uveitis, or retinitis, resembling pseudo-glioma, and leading to the complete destruction of the eye. Ocular paralyses are common and almost always of basal origin. They may be complete, or affect the abducens alone. Nystagmus and pupillary disturbances are noted in a few cases. The work includes a complete review of the literature on this subject.

MENETRIER and BLOCH (629, Weber's syndrome caused by a tumor of the temporo-sphenoidal lobe) studied the case of a woman who developed right hemiplegia with left-sided complete oculomotor paralysis. The autopsy showed normal pedunculi cerebri, with a metastatic carcinoma in the temporo-sphenoidal lobe. The primary growth was situated in the breast. The brain tumor had compressed the capsula interna and sent out a spur-shaped process toward the cavernous sinus. Here the oculomotor nerve was flattened at its point of entrance by the pressure of the tumor.

FORTUNATI (631, Histological study of a case of quinine amaurosis) had occasion to make a histological examination of the retina in a case of malaria, which had ended fatally of quinine poisoning after eight days' blindness. The ganglion cell-layer of the retina, the fibres of the optic nerve, the walls and the contents of the vessels were all found to be normal. The tissue of the optic nerve was also found intact.

CIRINCIONE.

OGG'S (632, Case of acute plumbic encephalopathy followed by muscular paralysis and optic neuritis) patient was a woman of

twenty-three, who had worked in a lead factory. During this time she suffered with anæmia, amenorrhœa, and attacks of colic with constipation. Suddenly there developed umbilical pains, headache, vomiting, vertigo, and delirium, with final loss of consciousness. The patient regained consciousness after six days, with a paralysis of both forearms and one leg, and became blind of optic atrophy following neuritis.

DEVEREUX MARSHALL.

REICHARDT (633, The development of cerebral compression in tumor and other affections of the brain, with a new form of brain swelling) concludes, from a study of nine typical cases, that the development of pressure symptoms in brain tumor depends principally on the relation of cranial capacity to brain weight. Pressure in small tumors is due to a pathologic reaction of the brain tissue to the new growth. General gliosis proliferation of the cerebral glia, or swelling of the brain, may develop. The site of the tumor is of importance, as intracerebral growths and those in the posterior half of the cranial cavity are, as a general thing, more apt to cause pressure than those outside the pia mater and those in the anterior half of the skull. The younger, more resistant, and healthier the brain is, the more easily it develops typical pressure symptoms and pressure psychoses. The only cases which speak against choked disk being a pathognomonic sign of pressure are those in which, despite the absence of choked disk, there is a marked disproportion between cranial capacity and brain weight, besides signs of chronic compression, especially affecting the bones of the cranial vault.

Obituary.

I.—**Dr. Frank Buller**, of Montreal, was born in 1844, and graduated in 1869 at Victoria College, Coburg. Then he spent two years on the continent of Europe, studying ophthalmology and otology under Helmholtz, von Graefe, and others. In the Franco-German war he served in a German military hospital, leaving for London in 1872, where he was two years house-surgeon at the Royal London Ophthalmic Hospital, working under Hutchinson, Critchett, Hulke, Lawson, and others. In 1876 he returned to Canada and settled in Montreal, practising his specialty until his death. He was the first Professor of Ophthalmology and Otology in McGill University. Physically strong, he was always ready for hard work; also a gifted, pleasant, industrious man; a good and erudite writer, his clinical publications being his best contributions. They extend over a period of thirty years, and number about seventy-five articles, according to Dr. J. Gardner, of Montreal, Canada, in *The Ophthalmoscope*, No. 1, January, 1906.

II.—**Dr. Swan M. Burnett**, of Washington, died suddenly at the age of fifty-eight, of œdema of the lungs. His friends, the Society of Ophthalmology and Otology of Washington, D. C., sent these ARCHIVES the announcement of his death, with resolutions printed in our January number, page 126. He was born in New Market, Tennessee, in 1847; graduated in Bellevue Medical College, New York, in 1870, and Professor of Ophthalmology in Georgetown University. Among his numerous publications are: *Color Vision*, 1884, and *Astigmatism*, 1887.

III.—**Dr. Louis de Wecker** died at the age of seventy-four. He was born in Frankfurt-on-Main in 1832, and studied at Würzburg. Later he was Desmarres's assistant in Paris, and studied with von Graefe in Berlin. In 1861 he graduated in Paris, and purchased from De Val the well-known clinic in the

Rue Visconti. A few years later he attended Léon Gambetta, removing one of his eyes. In 1870 he moved his clinic to the Rue du Cherche-Midi, which has been very successful. He did not leave it during the siege of Paris, and was nominated surgeon to the National Guard. His fame was wide. He was excessively active, well informed, not only in his specialty, but in science in general, a fertile writer in French, which in a foreigner is very rare; he was exceedingly ambitious. His practice was very extensive, his clientele being international. He was a profuse and substantial writer: *Traité des maladies des yeux*, 1863; *Thérapeutique oculaire*, 1878; *Traité des maladies du fond de l'œil*, 1870, and with Dr. Landolt the *Traité complet d'ophtalmologie*, 1882-1885. A zealous worker in medical societies; published any number of small articles on current ophthalmological questions of the day; and he was an excellent operator, especially for cataract. He invented several apparatus and instruments, one of his best being the *pincers-scissors* (forceps-scissors) for cutting tough membranes within the eye. He was quite a wanderer, staying two or three months in Cairo during the winter, and in summer living in his villa at the beautiful sea-bath Biarritz. Being very hospitable, he showed foreign *confrères* all his operative cases in the Rue du Cherche-Midi, operations which he and his very able assistant, Masselon, demonstrated with genuine kindness. His memory will last in the hearts of multitudes of his friends and pupils. In the history of ophthalmology he has a bright page.

IV.—**Dr. Med. Count John Magawly** died at Salzungen in Thuringen on August 29, 1904, and was buried at Leutsch, near Leipzig. He was born, July 7, 1831, at Hummingshile, near Riga, son of the Livonian Government-Councillor, Count Christopher Magawly, of an old noble Irish family. John studied medicine at old Dorpat, which he left in 1856 as Dr. Med. After his studies at Würzburg, Vienna, Prague, Paris, and Berlin, he settled, 1859, as ophthalmologist in St. Petersburg, where he lived from 1878 to 1904. He was appointed Ordinator in 1878, then Surgeon, and later Executive Surgeon of the Petersburg Ophthalmic Hospital. During the forty-one years this Institute developed gradually to one of the most renowned and largest in the world. He was efficiently seconded by his old friend **Dr. Robert Blessig**, the Executive Surgeon before he took

this position, and substantially aided by his able son-in-law, **Dr. Theodore von Schroeder**, who died too early. The writer (one year younger than Magawly) made his acquaintance in Albrecht von Graefe's clinic in Berlin and was with him in friendly intercourse. Professor von Graefe liked him and thought much of his talent and character. On my way to the International Medical Congress at Moscow, I looked him up in St. Petersburg. He invited me to stay at his residence, which was the upper story of the St. Petersburg Eye Hospital. The princely palace was the gift of the Empress Maria. Dr. Magawly and his family had there healthy, large, and sunny apartments. During a week my daughter and myself received the most exquisite hospitality from the Count, his daughter, and Dr. von Schroeder. The Countess was absent.

Naturally I took great interest in the hospital, admiring its cleanliness, the large rooms, corridors, stairs, and a garden. I saw the whole institution and its management, the desirable improvements which should and would be executed—for instance, a separate outhouse for children in the garden. Dr. von Schroeder and his assistants were busy with the Dispensary patients. There was order and despatch, without levity. I also witnessed several operations; they were well considered and neatly executed. This excellent institution was chiefly the work of Drs. Robert Blessig and Count Magawly.

The experience and research work in the Eye Hospital were published by Magawly, his co-operators, and assistants, in six separate small volumes under the title: "Communications from the Petersburg Eye Hospital." Numbers I. to VI., 1887-1899. These publications were very valuable—the results of the large clinical material in the Ambulance and the Hospital.*

* In the *St. Petersburger Zeitung*, 19 (31) July, 1899, I found a sketch of the history of the St. Petersburg Eye Hospital from its foundation until 1898. This was an essential feature in the life of **Magawly**, and as he, with **Blessig**, was the foremost benefactor of the Eye Hospital, the development of this model Institute will interest many of our readers.

The first attempt to found an Eye Hospital in St. Petersburg was in 1806, with an Ambulance (Dispensary), and an inmate department of seventeen beds. In 1816 Dr. **Lerche** was appointed Executive Surgeon, and the Eye Hospital became a department of the general charities. There the Ophthalmic Institute was not thrifty. On March 6, 1824, Emperor Alexander I. succeeded in interesting Prince Alexander Nicolajewitch Golitsyn. The Emperor sanctioned the foundation of an independent ophthalmic hospital, and promised a yearly con-

Ending this short sketch I may presume to comprise in one short sentence my judgment of himself and of all that knew him. It is : *Talent and efficiency were coupled in Magawly with, I may say, an angelic character whose chief traits were modesty and kindness.*

H. KNAPP.

tribution of 3000 rbl. (\$1500). Contributions of other people pledged 50-300 rbl. yearly, and others gave one sum of 5000 rbl. May 4, 1824, the St. Petersburg Ophthalmic Institute was inaugurated in a moderate house rented, with ten beds. Dr. **Lerche** remained Executive. In the first year there were 2968 out-patients and 210 inmates. In 1826 Emperor Nicolai I. consented to buy and equip a house for an eye hospital, and he gave 40,000 rbl. to defray the expense. In March, 1827, they bought a house for 132,000 rbl. ; the completing of it cost 60,000 rbl. more. The Hospital now had forty beds, twenty-seven for males, thirteen for females. In 1834 there were 7000 out-patients and 350 inmates. In 1837 they bought a site for 40,000 rbl. and paid 250,000 rbl. for the building, and 40,000 rbl. was collected from residents of the city. The Institute had eighty beds. Prince Peter of Oldenburg was the protector.

In 1879 the Institute was amalgamated with the other charitable institutions of the Empress Maria Feodorovna. The Eye Hospital was now secured, and improvements were made. During the leadership of the able and popular Dr. R. Pp. **Blessig** (1803-1838), the number of patients increased considerably : from 7000 out-patients in 1863 to 14,500 in 1878. After the death of **Blessig**, his co-operator and friend Dr. **Magawly** was appointed Executive Surgeon, under whose leadership the Institute has grown quite unexpectedly. In 1878 there were 14,500 patients ; in the year 1896 there were counted 24,016 out-patients, who made 55,673 visits. The number of inmates rose from 750 to 1300. Among the 51,593 cases there were 58,570 operations done, of which there were 7263 cataract extractions, and 8400 iridectomies. In the Dispensary 756,784 were treated from 1824 to 1896, in summa 756,884 patients, of whom 559,294 free of charge. Dr. **Magawly** with Dr. **Schroeder** and other younger and able men taught students of ophthalmology all the year, who later will go to the different governments of this enormous empire. The financial condition of the Eye Hospital is not brilliant, in spite of her seventy-five years. In 1898 its endowment fund yielded 1048 rbl. The city gives a yearly contribution of 1000 rbl.

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